2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 PROPOSED FACILITIES

Southern proposes to construct and operate new natural gas pipeline facilities that would interconnect with its existing natural gas transmission facilities near Savannah, Georgia and FGT's existing natural gas transmission facilities near Jacksonville, Florida. The new system would consist of new mainline, pipeline loop, lateral pipeline, compressor stations, meter stations, and associated facilities. Southern would construct these facilities in three phases as detailed in section 2.4.

In order to accept and transport the gas volumes to be delivered by Southern, FGT proposes to construct and operate new pipeline loops, additional compression, and associated facilities on its existing natural gas transmission system in Florida. FGT would construct these facilities in two phases as detailed in section 2.4.

A summary of the proposed pipeline and aboveground facilities is provided in table 2.1-1. The Southern and FGT pipeline facilities and aboveground facilities are also described in greater detail in sections 2.1.1 and 2.1.2, respectively. A general location map is provided as figure 2.1-1. Detailed facility location maps are provided in Appendix B as figures B-1 and B-2 for the Cypress Pipeline and FGT Expansion Projects, respectively.

TABLE 2.1-1

Proposed Facilities for the Cypress Pipeline and FGT Expansion Projects

Facilities	Number	Pipeline Diameter (inches)	Length (miles)
Southern Pipeline Facilities			
Loop	1	30	9.8
Mainline	1	24	166.9
Lateral	1	12	0.1
Subtotal			176.8
FGT Pipeline Facilities			
Loop(s)	3	36	32.6
Total			**209.4**
Southern Aboveground Facilities			
New Compressor Stations	3	-	-
New Meter Stations	4	-	-
Existing Meter Station Upgrades	2	-	-
New Mainline Block Valves	14	24	-
New Loop Block Valves	2	30	
Launcher/Receiver Facilities	4	-	-
FGT Aboveground Facilities			
Existing Compressor Station Upgrades	5	-	-
New Interconnect/Meter Station/Valve Site	1	-	-
Existing Meter/Regulator Station Upgrades	5	-	-
Remote Blowdown Piping Sites	4	-	-

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FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED CYPRESS PIPELINE PROJECT and
FGT PHASE VII EXPANSION PROJECT
Docket Nos. CP05-388-000 and CP06-001-000

Figure 2.1-1 General Location Map

Public access for the above information is available only through the Public Reference Room, or by e-mail at public.referenceroom@ferc.gov.

2.1.1 Cypress Pipeline Project

2.1.1.1 Pipeline Facilities

The natural gas pipeline facilities proposed by Southern would consist of:

- about 166.9 miles of new 24-inch-diameter mainline pipeline (mainline) that would extend from Southern's existing Rincon Gate Meter Station in Effingham County, Georgia to FGT's existing pipeline system in Clay County, Florida;

- about 9.8 miles of 30-inch-diameter pipeline loop (loop) adjacent to Southern's existing Wrens-Savannah pipelines between Southern's existing Port Wentworth Meter Station in Chatham County, Georgia and the Rincon Gate Meter Station in Effingham County, Georgia; and

- about 0.1 mile of 12-inch-diameter lateral pipeline (lateral) from Southern's proposed new mainline to the Jacksonville Electric Authority (JEA) Brandy Branch Power Plant in Duval County, Florida.

Table 2.1.1-1 lists the pipeline facilities by state, county, milepost (MP), pipe diameter, and pipeline length.

2.1.1.2 Aboveground Facilities

Southern would construct new compressor stations, meter stations, mainline valves, and pig[1] launcher/receiver facilities, and would also expand or modify existing meter stations and install other associated facilities, as part of the Cypress Pipeline Project. The aboveground facilities proposed by Southern include:

- three new 10,350 horsepower (hp) gas-turbine-driven compressor stations to be located in Liberty and Glynn Counties, Georgia, and in Nassau County, Florida;

- four new meter stations including:

  - AGL Meter Station in Glynn County, Georgia;

  - South Georgia Meter Station in Nassau County, Florida;

  - JEA Brandy Branch Meter Station in Duval County, Florida; and

  - FGT Meter Station in Clay County, Florida;

- modifications to two existing meter stations including the Port Wentworth Meter Station in Chatham County, Georgia and the Marietta Meter Station in Cobb County, Georgia;

- expansion of the Rincon Gate Meter Station in Effingham County, Georgia;

- 16 new block valves including 14 associated with the new mainline and 2 associated with the loop; and

[1] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

- four new pig launcher/receiver facilities associated with the Port Wentworth, Rincon Gate, and FGT Meter Stations, and the new compressor station in Glynn County, Georgia.

Table 2.1.1-2 lists the aboveground facilities for the Cypress Pipeline Project by name, MP, county, and state, and identifies the aboveground facilities that would be collocated at each site.

TABLE 2.1.1-1

Proposed Pipeline Facilities for the Cypress Pipeline Project

State and County	Mileposts	Pipeline Diameter (inches)	Length (miles) [a]
Georgia Loop			
Effingham	95.0 - 100.0 [b]	30	5.0
Chatham	100.0 - 104.8	30	4.8
Georgia Loop total			9.8
Georgia Mainline			
Effingham	0.0 - 12.7	24	12.7
Chatham	12.7 - R23.8 [c]	24	11.6
Bryan	R23.8 - R27.3	24	7.5
Liberty	26.0 - 43.7	24	18.0
Long	43.7 - 45.8	24	2.1
McIntosh	45.8 - 62.8	24	17.1
Glynn	62.8 - 86.4	24	24.0
Camden	86.4 - 104.2	24	17.9
Charlton	104.2 - 115.4	24	11.4
Georgia Mainline total			122.3
Georgia Total			132.1
Florida Mainline			
Nassau	115.4 - 145.6	24	30.3
Duval	145.6 - 158.9	24	13.5
Clay	158.9 - 159.8	24	0.5
Florida Mainline total			44.6
Florida Lateral			
Duval (Brandy Branch Lateral)	149.6	12	0.1
Florida Total			44.7
Mainline total			**166.9**
Loop total			**9.8**
Lateral total			**0.1**
Total			**176.8**

[a] Actual miles of pipeline required may be greater due to adjustments for pipe bends along ground contours. In addition, length may not equal difference between mileposts. Mileposts are for reference purposes only.

[b] Mileposts reference the existing Wrens-Savannah pipeline system mileposts.

[c] "R" indicates re-routed mileposts R13.8-R27.3.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

TABLE 2.1.1-2

Proposed Aboveground Facilities for the Cypress Pipeline Project

Facility Name	Milepost	County, State	Description
New Compressor Stations			
Compressor Station #1	40.5	Liberty, Georgia	Install 10,350 horsepower (hp) of new compression and one new mainline block valve
Compressor Station #2	81.1	Glynn, Georgia	Install 10,350 hp of new compression, one new mainline block valve, one mainline pig launcher, and one mainline pig receiver
Compressor Station #3	126.8	Nassau, Florida	Install 10,350 horsepower (hp) of new compression and one new mainline block valve
New Meter Stations			
AGL Meter Station	66.0	Glynn, Georgia	Install one new meter station and mainline block valve
South Georgia Meter Station	143.7	Nassau, Florida	Install one new meter station and mainline block valve
JEA Brandy Branch Meter Station	149.7	Duval, Florida	Install one new meter station and lateral pipeline
FGT Meter Station	159.8	Clay, Florida	Install one new meter station, one mainline block valve, one mainline pig receiver, and an interconnection with FGT pipeline facilities
Existing Meter Station Upgrades			
Rincon Gate Meter Station	0.0 (mainline) 95.0 (loop)	Effingham, Georgia	Install tie-in between loop and mainline, one mainline block valve, one loop valve, regulator setting, loop pig launcher, and mainline receiver
Port Wentworth Meter Station	104.8 (loop)	Effingham, Georgia	Install tie-in to new loop with a new loop block valve and pig launcher
Marietta Meter Station	Offline	Cobb, Georgia	Reconfigure piping to improve efficiency
New Mainline Block Valves (MLV)			
MLV #1	0.0	Effingham, Georgia	Install mainline block valve within proposed Rincon Gate Meter Station
MLV #2	7.7	Effingham, Georgia	Install mainline block valve in new permanent right-of-way for mainline
MLV #3	R 15.1[a]	Chatham, Georgia	Install mainline block valve in new permanent right-of-way for mainline
MLV #4	R 25.8[a]	Bryan, Georgia	Install mainline block valve in new permanent right-of-way for mainline
MLV #5	40.5	Liberty, Georgia	Install mainline block valve in new permanent right-of-way for mainline adjacent to Compressor Station #1
MLV #6	57.4	McIntosh, Georgia	Install mainline block valve in new permanent right-of-way for mainline
MLV #7	66.0	Glynn, Georgia	Install mainline block valve in new permanent right-of-way for mainline adjacent to AGL Meter Station
MLV #8	81.1	Glynn, Georgia	Install mainline block valve in new permanent right-of-way for mainline adjacent to Compressor Station #2 and mainline block valve #9
MLV #9	81.1	Glynn, Georgia	Install mainline block valve in new permanent right-of-way for mainline adjacent to Compressor Station #2 and mainline block valve #8
MLV #10	99.9	Camden, Georgia	Install mainline block valve in new permanent right-of-way for mainline
MLV #11	119.2	Nassau, Florida	Install mainline block valve in new permanent right-of-way for mainline
MLV #12	126.8	Nassau, Florida	Install mainline block valve in new permanent right-of-way for mainline adjacent to Compressor Station #3
MLV #13	143.7	Nassau, Florida	Install mainline block valve in new permanent right-of-way for mainline adjacent to South Georgia Meter Station

TABLE 2.1.1-2 (cont'd)

Proposed Aboveground Facilities for the Cypress Pipeline Project

Facility Name	Milepost	County, State	Description
MLV #14	159.8	Clay, Florida	Install mainline block valve in new FGT Meter Station
New Loop Block Valves (LBV)			
LBV #1	104.8	Effingham, Georgia	Install loop block valve in existing Port Wentworth Meter Station
LBV #2	95.0	Effingham, Georgia	Install loop block valve in existing Rincon Gate Meter Station
New Pig Launchers and/or Receivers			
Loop launcher	104.8	Effingham, Georgia	Install new loop pig launcher in existing Port Wentworth Meter Station
Loop launcher & mainline receiver	95.0	Effingham, Georgia	Install new loop pig launcher and mainline pig receiver in existing Rincon Gate Meter Station
Mainline launcher & receiver	81.1	Glynn, Georgia	Install new mainline pig launcher and receiver in Compression Station #2
Mainline receiver	159.8	Clay, Florida	Install new mainline pig receiver in new FGT Meter Station

[a] "R" indicates re-routed mileposts R13.8-R27.3.

2.1.1.3 Extra Workspaces, Yards, and Access Roads

Southern proposes to use extra workspaces, warehouse yards, pipe yards, and access roads in addition to the pipeline and aboveground facilities described above. Extra workspaces are proposed where specialized construction methods are needed at road, railroad, foreign pipeline, waterbody, and inundated wetland crossings, and at tie-in locations, truck turnarounds, and other areas where necessary for safe equipment operation and materials handling. Southern identified 21 extra workspace locations for the loop and 329 for the mainline construction. The locations of extra workspaces by county and MP are provided in table C-1 of Appendix C, with a description of why the extra workspace is needed.

Southern has identified 11 warehouse yards or pipe yards that would be used for the project. These yards would be used by the contractor and/or Southern to stage personnel, equipment, new pipe, and other materials necessary for construction of the facilities, and could include contractor trailers, construction equipment, fuel/lubricants, and parking areas. The location of proposed warehouse yards and pipeyards is provided in table C-1 of Appendix C by county and MP.

Southern has identified 230 existing public and private roads that would be used during construction to provide equipment, materials, and personnel access to the right-of-way. Of the proposed access roads, four would require minor improvements to make them suitable for construction, and the remainder would be used "as-is" except where minor grading and fill may be required to repair rutting and existing potholes. Certain access roads would also be designated for use by light duty vehicles only. The existing access roads that Southern would use for the loop, mainline, and aboveground facilities are listed in table C-2 of Appendix C by county, state, and approximate MP. Table C-2 also identifies the roads that would receive minor improvements, be designated for light duty traffic, become new permanent access to aboveground facilities, and summarizes the existing characteristics including wetlands and waterbodies associated with each road.

New access roads would be constructed to provide permanent access to eight of the aboveground facilities as summarized in table 2.1.1-3. Of the eight new roads, seven would be located within, and one would extend slightly outside, the proposed permanent right-of-way for the mainline. Permanent access to other aboveground facilities (not listed in table 2.1.1-3) would occur from existing roads as identified in table C-2 of Appendix C.

TABLE 2.1.1-3

Proposed New Access Roads for the Cypress Pipeline Project

Facility	County and State	Approximate Mileposts	Length (feet)	Acreage [b]
MLV #2 [a]	Effingham, GA	7.7	456	0.2
MLV #3 [a]	Chatham, GA	R15.1	338	0.1
MLV #4	Bryan, GA	R25.6	54	<0.1
MLV #6 [a]	McIntosh, GA	57.4	151	0.1
AGL Meter Station [a]	Glynn, GA	66.1	1,528	0.5
MLV #10 [a]	Camden, GA	99.9	334	0.1
MLV #11 [a]	Nassau. FL	119.2	71	<0.1
South Georgia Meter Station [a]	Nassau, FL	143.7	254	0.1
Total				1.3

[a] Roads located within permanent right-of-way for mainline.

[b] Based on a 15-foot road width.

2.1.2 FGT Expansion Project

2.1.2.1 Pipeline Facilities

The natural gas pipeline facilities proposed by FGT would consist of about 32.6 miles of 36-inch-diameter loop pipeline in three separate locations. The three loops would include:

- Loop J consisting of about 5 miles of 36-inch-diameter loop adjacent to FGT's existing pipeline in Gilchrist County, Florida;
- Loop K consisting of about 15.2 miles of 36-inch-diameter loop adjacent to FGT's existing pipeline in Levy County, Florida; and
- Loop G consisting of about 12.4 miles of 36-inch-diameter loop adjacent to FGT's existing pipeline in Hernando County, Florida.

Table 2.1.2-1 lists the pipeline facilities by county and state, MP, pipe diameter, and pipeline length.

TABLE 2.1.2-1

Proposed Pipeline Facilities for the FGT Expansion Project

State and County	Mileposts	Pipeline Diameter (inches)	Length (miles)
FGT EXPANSION PROJECT			
Florida Loop			
Gilchrist (Loop J)	12.8 - 17.8 [a]	36	5.0
Levy (Loop K)	38.5 - 53.7	36	15.2
Hernando (Loop G)	104.9 - 117.0	36	12.4 [b]
Total			**32.6**

[a] Mileposts reference FGT's existing West Leg pipeline system mileposts.

[b] Length is greater than the distance between mileposts due to crossovers of the existing right-of-way.

2.1.2.2 Aboveground Facilities

FGT would install new or modified aboveground facilities at existing aboveground sites or in association with the new pipeline loops as part of the FGT Expansion Project. These aboveground facilities would include:

- replacement of one existing compressor with one new 15,000 hp electric driven compressor with associated cooling equipment, requiring expansion of the existing compressor station building by about 6 feet to the east, for a net increase of about 7,800 hp, and re-wheeling two existing compressors, at FGT's Compressor Station No. 26 (Compressor Station 26) in Citrus County, Florida;
- replacement of one existing compressor with a new, larger compressor to add about 2,000 hp of additional compression at FGT's existing Compressor Station No. 24 (Compressor Station 24) in Gilcrist County, Florida;

- modification of suction piping and rework existing compressor piston/pockets within the existing fence at FGT's Compressor Station No. 16 (Compressor Station 16) in Bradford County, Florida;

- re-wheeling two existing compressor engines within the existing fence at FGT's Compressor Station No. 27 (Compressor Station 27) in Hillsborough County, Florida;

- install a chromatograph and sulphur analyzer within the existing site at FGT's Compressor Station No. 17 (Compressor Station 17) in Marion County, Florida;

- a new interconnection with Southern's new mainline in Clay County, Florida (Cypress/FGT Interconnect) consisting of interconnecting piping, a side valve, a block valve, gas odorization equipment, electronic flow measurement, and over-pressure protection;

- modifications to five existing metering and/or regulation (M&R) stations including the Long Branch Regulator Station in Clay County; Hines Metering and Regulation Station (Hines M&R Station) in Polk County; the Brandy Branch M&R Station in Bradford County; the Jacksonville M&R Station in Duval County; and the Lawtey Regulator Station in Bradford County, Florida; and

- new remote blowdown piping at two locations associated with Loop K in Levy County (Loop K Remote Blowdown) and two locations associated with Loop G in Hernando County, Florida (Loop G Remote Blowdown).

Table 2.1.2-2 lists the proposed new and modified aboveground facilities that would be installed at existing facility sites as part of the FGT Expansion Project, including the county and approximate MP locations.

2.1.2.3 Extra Workspaces, Yards, and Access Roads

FGT proposes to use extra workspaces, contractor yards, pipe yards, and access roads. Extra workspaces are proposed for road, railroad, and waterbody crossings, and for tie-ins, equipment travel zones, remote blowdowns, hydrostatic testing, and staging areas. FGT identified 102 temporary extra workspaces for their project, including 20 for Loop J, 21 for Loop K, and 61 for Loop G. The locations of temporary extra workspaces by county and milepost are provided in table C-3 in Appendix C with a description of why the extra workspace is needed.

FGT has identified five contractor yards or pipeyards that would be used for the project. These yards would be used by the contractor and/or FGT to stage personnel, equipment, new pipe, and other materials necessary for construction of the facilities, and could include contractor trailers, construction equipment, fuel/lubricants, and parking areas. The locations of the proposed contractor yards and pipe yards are provided in table C-4 in Appendix C by county.

FGT would use existing public and private roads and the pipeline or powerline right-of-way for access during construction. Of the proposed access roads, FGT identified 10 that would be graded to make them suitable for construction. Of those 10 roads, four would become permanent access to the proposed new blowdown facilities on Loops K and G. FGT's proposed new permanent access roads and temporary access roads that would be graded are listed in table C-5 in Appendix C by county and approximate milepost.

TABLE 2.1.2-2

Proposed Aboveground Facilities for the FGT Expansion Project

Facility Name	Milepost [a]	County	Description
Compressor Station 26	West Leg MP 90.6	Citrus	Add 7,800 hp by replacing existing compressor and slightly expanding the existing building, add cooling equipment, and re-wheel two existing compressor units.
Compressor Station 24	West Leg MP 25.4	Gilchrist	Add 2,000 hp by replacing one existing compressor unit.
Compressor Station 16	Jacksonville Lateral MP 0.0	Bradford	Modified suction piping and rework existing compressor piston/pockets.
Compressor Station 17	FGT Mainline MP 608.0	Marion	Install chromatograph and sulphur analyzer within existing site.
Compressor Station 27	West Leg MP 160.2	Hillsborough	Re-wheel two existing compressor units within existing building.
Cypress/FGT Interconnect	Jacksonville Lateral MP 27.6	Clay	Install interconnection piping, two block valves, regulator, metering, and over-pressure protection.
Long Branch Regulator Station	FGT Mainline MP 27.6	Clay	New regulator station east of Cypress/FGT Interconnect.
Hines M&R Station	Agricola Lateral MP 7.3	Polk	Install new meter and filter separator, replace regulators.
Brandy Branch M&R Station	Jacksonville Lateral MP 21.1	Bradford	Install dual probe chromatograph; one within existing site and one on Jacksonville Lateral.
Jacksonville M&R Station	Jacksonville Lateral MP 45.3	Duval	Install chromatograph within existing site.
Lawtey Regulator Station	Jacksonville Lateral MP 21.2	Bradford	Modify to allow bi-directional flow.
Loop K Remote Blowdowns	West Leg MPs 44.5 and 53.7	Levy	Install piping for routine maintenance in new fenced areas.
Loop G Remote Blowdowns	West Leg MPs 110.8 and 116.8	Hernando	Install piping for routine maintenance in new fenced areas.

[a] Indicates names and mileposts relative to the existing FGT pipeline system facilities.

2.2 LAND REQUIREMENTS

The land requirements for construction and operation of the Southern and FGT pipeline and aboveground facilities are summarized in table 2.2-1. Detailed breakdowns for each project are provided in sections 2.2.1 and 2.2.2, respectively, including the land required for construction and operation of the pipeline, aboveground facilities, extra workspaces, storage/contractor yards, and access roads. The land use impacts by county associated with these land requirements are presented in section 4.8.1.

TABLE 2.2-1

Land Requirements for the Southern and FGT Facilities

Facilities		Construction Impacts (acres)	Operation Impact (acres)
Southern Facilities			
Pipelines		1,893.1	839.9
Aboveground Facilities		49.6	22.6
Extra Workspaces		60.3	0.0
Storage/Contractor Yards		157.3	0.0
Access Roads [a]		1.3	1.3
	Subtotal	2,161.6	863.8
FGT Facilities			
Pipelines		409.5	152.7
Aboveground Facilities		25.8	5.9
Extra Workspaces		47.5	0.0
Storage/Contractor Yards		59.3	0.0
Access Roads [b]		9.5	2.3
	Subtotal	551.6	160.9
	Total	2,713.2	1,024.7

[a] Construction and operation impacts include only the acreage for temporary and permanent access to MLV 4 and the FGT Meter Station. Other access road impacts are already accounted for in construction impacts for pipelines and aboveground facilities acreage, or would be negligible. Operation impact does not include permanent access roads to compressor stations, which are already part of the aboveground facilities acreages. Operation impact also does not include about 1.1 acre of new permanent access roads that would located within the operation impact for the pipelines to access the new meter stations and MLVs.

[b] Four existing roads would be upgraded and become permanent access roads to the blowdown facilities.

2.2.1 Cypress Pipeline Project

Construction of the proposed Cypress Pipeline Project would disturb about 2,161.6 acres of land for the pipeline construction rights-of-way, aboveground facilities, extra workspaces, storage/contractor yards, and access roads. Of this total, about 1,893.1 acres would be disturbed by the pipeline construction right-of-way, about 49.6 acres would be disturbed for the aboveground facilities, and about 60.3, 157.3, and 1.3 acres would be disturbed for the extra workspaces, yards, and access roads, respectively.

Southern proposes to use about 863.8 acres for operation of the project facilities. Of this total, 839.9 acres would be associated with the permanent pipeline right-of-way, 22.6 acres would be for the aboveground facilities, and 1.3 acres would be needed for new permanent access roads that are not located within the proposed pipeline or aboveground facility permanent rights-of-way. Southern would restore the remaining 1,297.8 acres of land and allow this land to revert to its former use. Table 2.2.1-1 summarizes the land requirements for construction and operation of the Cypress Pipeline Project.

TABLE 2.2.1-1

Summary of Land Requirements Associated with the Cypress Pipeline Project

Facility	Land Affected During Construction (acres)	New Land Affected During Operation (acres)
Pipeline Facilities [a]		
Loop	101.9	0.5
Mainline	1,790.5	839.0
Lateral	0.7	0.4
Pipeline Facilities Total	1,893.1	839.9
Aboveground Facilities [b]		
Compressor Station #1	13.5	5.5
Compressor Station #2	15.6	5.9
Compressor Station #3	13.6	5.1
New Meter Stations		
AGL Meter Station	1.0	1.0
South Georgia Meter Station	1.1	1.1
JEA Brandy Branch Meter Station	1.0	1.0
FGT Meter Station	1.0	1.0
Rincon Gate Meter Station	1.7	1.2
Port Wentworth	0.3	0.0
Marietta Meter Station	0.8	0.8
Block Valves [c]	<0.1	<0.1
Aboveground Facilities Total	49.6	22.6
Extra Workspaces	60.3	0.0
Storage/Contractor Yards	157.3	0.0
Access Roads	1.3	1.3
Project Total	**2,161.6**	**863.8**

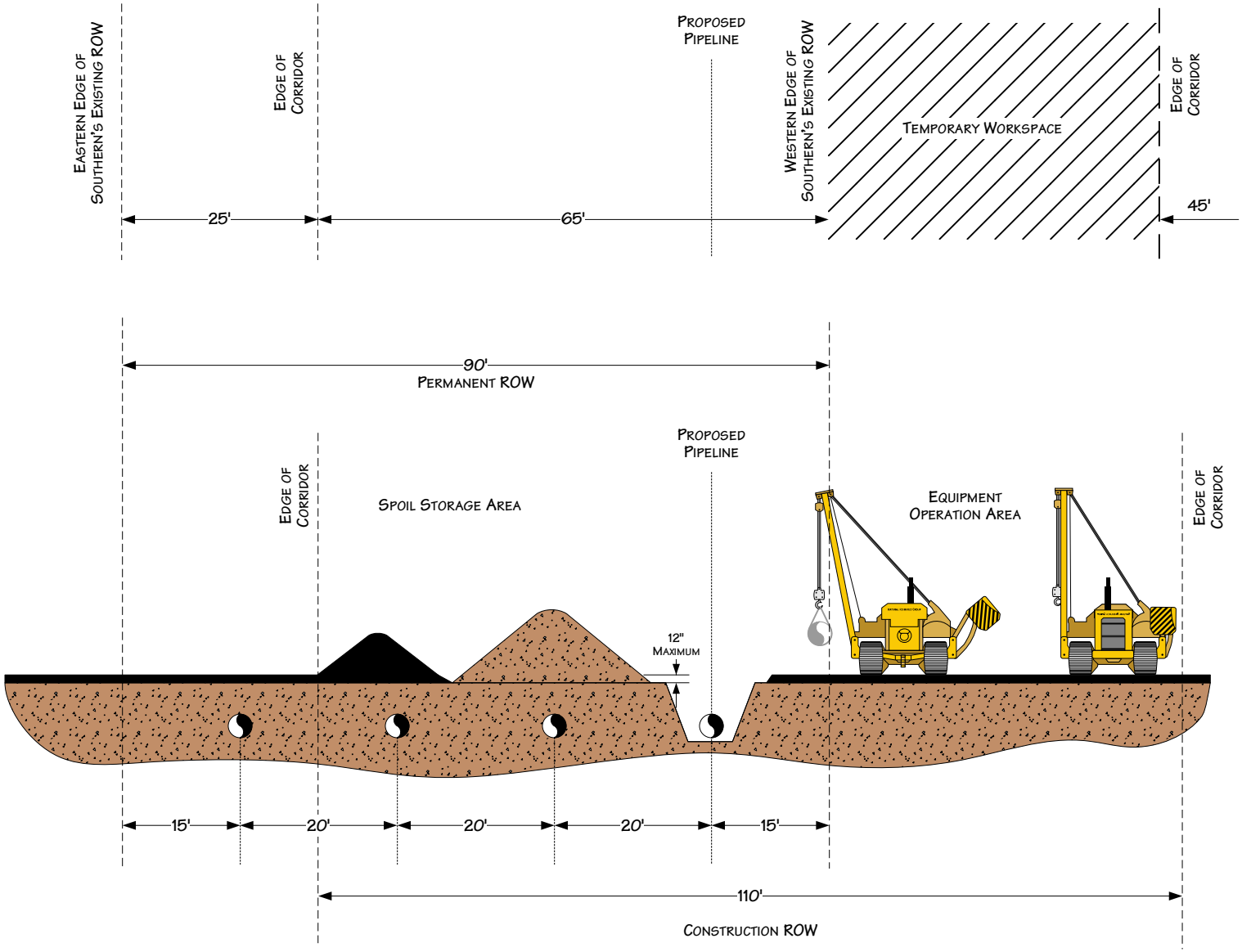
[a] Land affected during construction is based on Southern's proposed 110-foot-wide or 97-foot-wide construction right-of-way in uplands for loop and mainline, respectively, and a 75-foot-wide construction right-of-way in wetlands. Land affected during operation is based on a 50-foot-wide permanent right-of-way in uplands, and a 30-foot-wide maintained permanent right-of-way in wetlands.

[b] Pig launcher/receiver facilities would be located within the permanent pipeline right-of-way or within the fence lines of the compressor station and meter station sites, and are not itemized separately.

[c] Land required for operation reflects total acreage for new block valve operations (fence and graveled areas) and is not included in project total since these facilities are generally within the land required for mainline, meter station, or compressor station operation. Three block valves would require a minor amount of land adjacent to the mainline right-of-way (less than 0.1 acre combined).

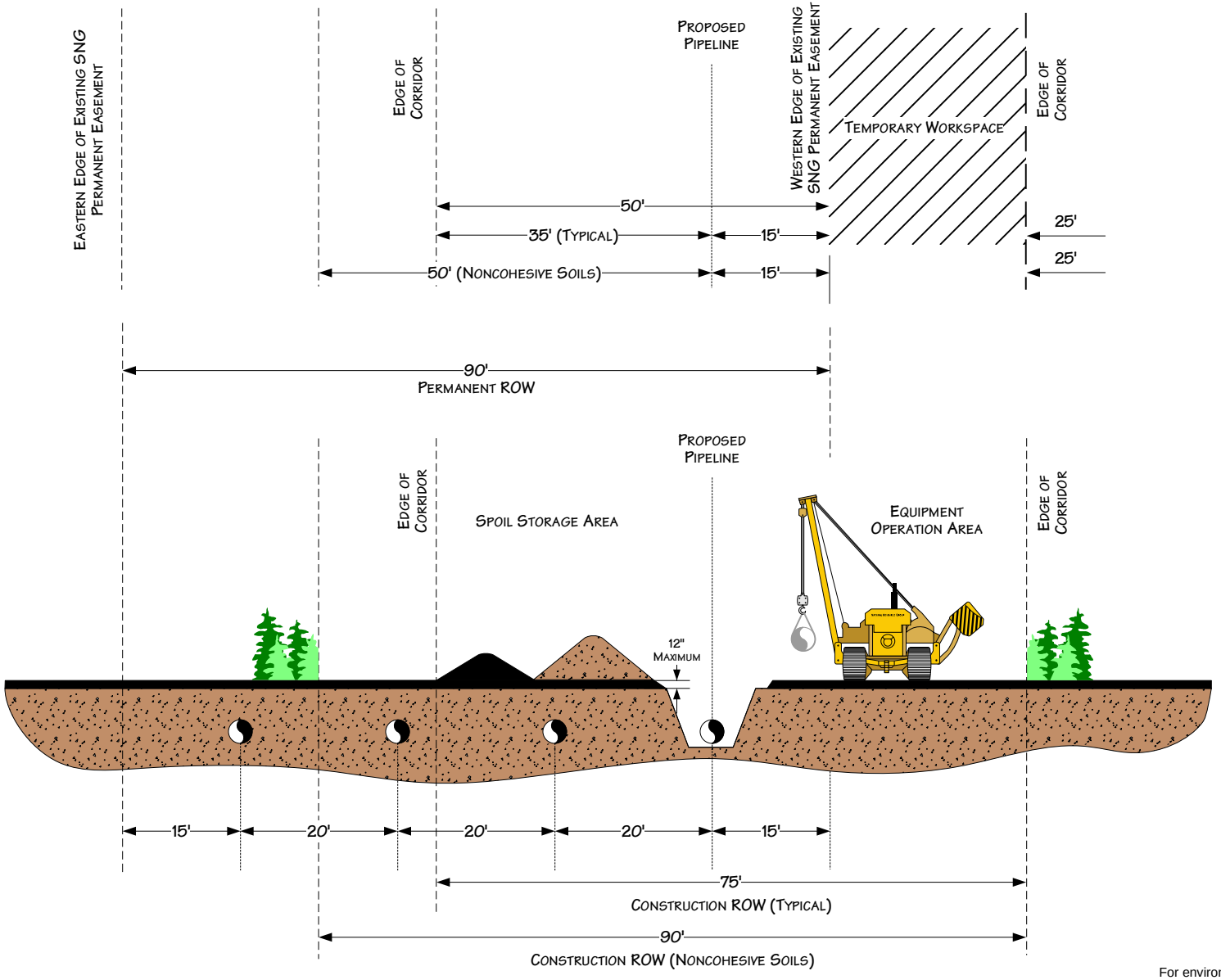
Pipeline Rights-of-Way

Southern's pipeline loop would be installed 15 feet inside the western edge of Southern's existing Wrens-Savannah pipeline right-of-way and 20 feet from the nearest pipeline. The Wrens-Savannah pipeline right-of-way is currently 90 feet wide and includes three existing pipelines that are each separated by 20 feet. Due to potential safety and pipeline integrity issues associated with operating heavy construction equipment over existing pipelines, Southern proposes to use a construction right-of-way for its pipeline loop that would typically be 110 feet wide in uplands and include 65 feet of Southern's existing permanent right-of-way for spoil storage and 45 feet of temporary workspace (outside the permanent right-of-way) for equipment operation (see figure 2.2.1-1). In wetlands (see figure 2.2.1-2), Southern's construction right-of-way would typically be 75 feet wide and include 50 feet of Southern's existing permanent right-of-way and 25 feet of temporary workspace. In saturated wetlands with sandy soils, Southern proposes to use a 90-foot-wide construction right-of-way including 65 feet of existing permanent right-of-way and 25 feet of temporary workspace. A relatively minor amount of new permanent right-of-way (about 0.5 acre) would be obtained by Southern to allow for periodic maintenance of the new pipeline loop.



For environmental review purposes only.

Figure 2.2.1-1
Cypress Pipeline Project
Typical Rights-of-Way (ROW)
Loop in Uplands



For environmental review purposes only.

Figure 2.2.1-2
Cypress Pipeline Project
Typical Rights-of-Way (ROW)
Loop in Wetlands

Southern's mainline would be constructed in a new 50-foot-wide permanent pipeline right-of-way that would be directly adjacent to various existing rights-of-way (e.g., powerline, road, fiber optic and/or pipeline) for about 95 percent of its length. The locations, lengths, operators, and types of existing rights-of-ways that abut the proposed pipeline right-of-way and would be partly overlapped are summarized in table 2.2.1-2. The remaining 5 percent of the mainline would be newly created right-of-way associated with route variations to avoid or minimize impacts to specific residences, commercial areas, wetlands and waterbodies. Route variations are described in greater detail in section 3.3.2.

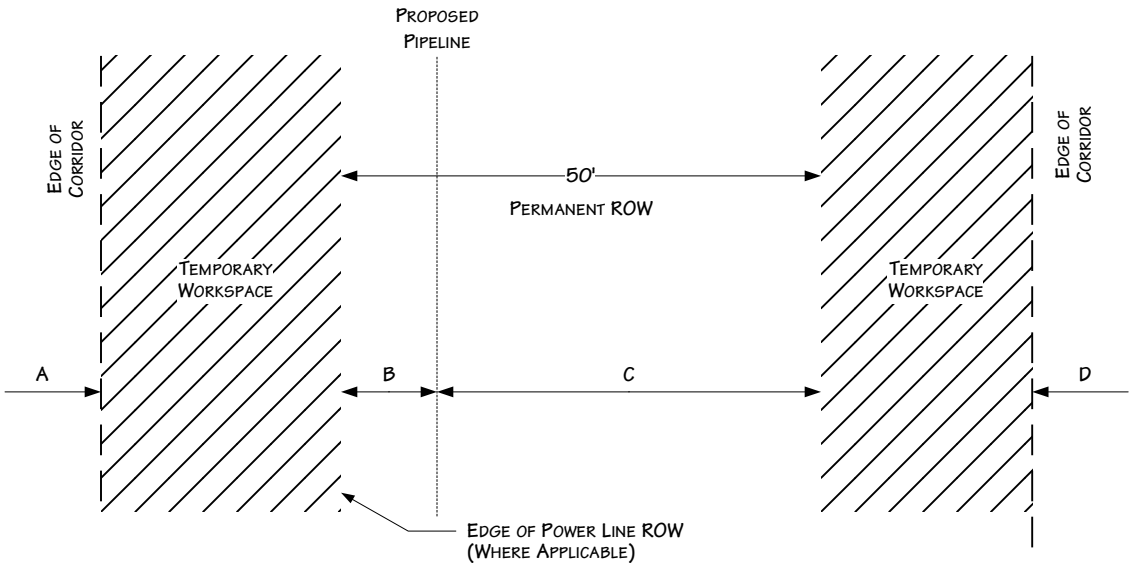
Southern's mainline would typically be installed 10 feet from the edge of existing rights-of-way or 35 feet where powerline guy wires exist, and would use a construction right-of-way that is typically 97 feet wide in uplands and 75 feet wide in wetlands. Southern's upland construction right-of-way would typically use 32 feet of the existing adjacent rights-of-way for spoil storage and 15 feet outside the new permanent pipeline right-of-way for equipment operation, or 7 feet and 40 feet, respectively, where guy wires exist (see figure 2.2.1-3). In locations where topsoil segregation is required, Southern proposes to use an additional 3 feet on the spoil side that would overlap existing rights-of-way, and 3 less feet on the working (equipment operation) side.

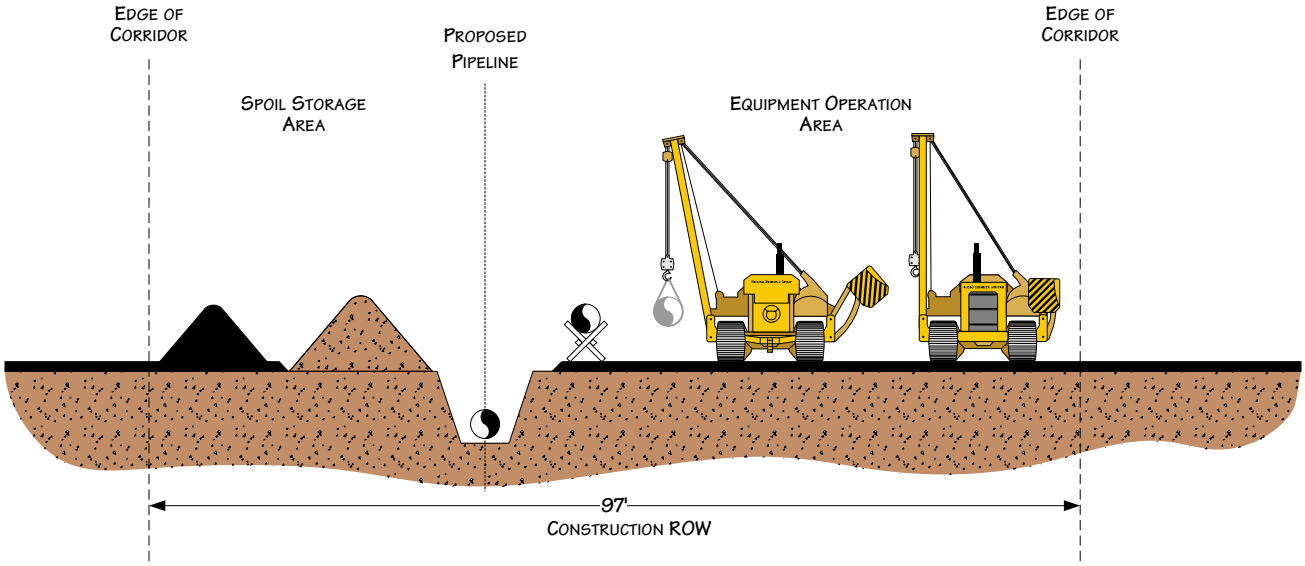
Southern's 75-foot-wide construction right-of-way in wetlands would use 25 feet of existing rights-of-way for temporary workspace adjacent to the proposed new 50-foot-wide permanent right-of-way (see figure 2.2.1-4), except where powerline guy wires exist (MPs 22.1 to 36.1). In locations with guy wires, Southern would use 25 feet of temporary workspace outside the new permanent right-of-way (further away from existing right-of-way corridors). Also, in saturated wetlands with sandy soils, Southern has requested to use up to 7 feet of additional temporary workspace for additional spoil storage, which would be located within existing rights-of-way. As a result, the total construction right-of-way could increase to 82 feet wide in wetlands with sandy soils. These locations are described in section 4.2.3.

Aboveground Facilities

Southern would obtain more than 30 acres for each new compressor station site, but the majority of that land would be used to buffer and screen the compressor facilities, and less than half would be used for construction and operation. Compressor Station 1 would be located on a 32.6-acre site, of which 13.5 acres would be used for construction and 5.5 acres would be fenced for operation. Compressor Station 2 would be located on a 36.0-acre site, of which 15.6 acres would be used for construction and 5.9 acres would be fenced for operation. Compressor Station 3 would be located on a 35.0-acre site, of which 13.6 acres would be used for construction and 5.1 acres would be fenced for operation.

New meter stations would each require about 1.0 acre for both construction and operation, except for the South Georgia Meter Station, which would require about 1.1 acre. The upgrades to Southern's existing Rincon Gate Meter Station would disturb about 1.7 acres of land and would increase the operational footprint of that site by 1.2 acres. The Port Wentworth Meter Station and Marrietta Meter Station upgrades would disturb about 0.3 acre and 0.8 acre of land, respectively, within the existing fence lines. Four of the 16 new block valves would be installed within existing or new meter station sites and would not require additional land disturbance beyond that described for the meter station sites. The other 12 valve sites would be installed within the footprint of the pipeline construction and permanent right-of-way and would be permanently fenced and graveled for a combined total of <0.1 acre of land impacts. Each block valve facility would typically include a blowdown valve and bypass valves for maintenance. New pig launcher and receiver facilities would be constructed and operated within land disturbed and operated for proposed compressor or meter station sites.



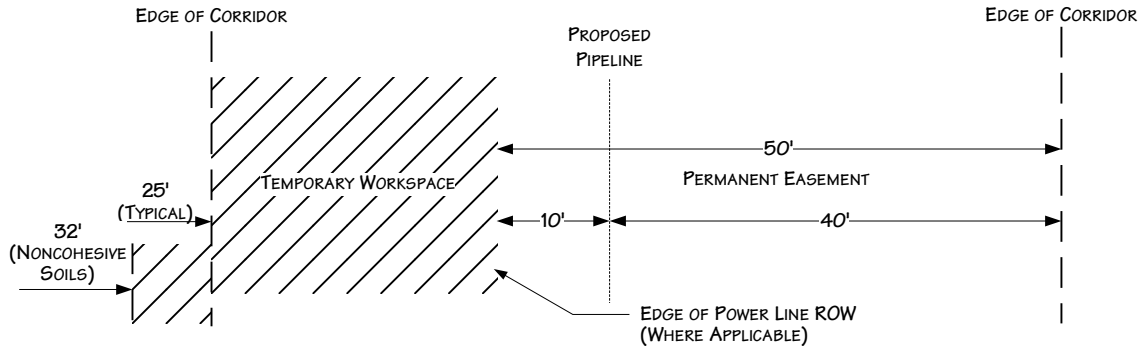


Condition	Overlap on Existing ROW A	Pipeline Offset from Existing ROW B	Pipeline Offset from New ROW Edge C	Temporary Workspace D
1. No topsoil segregation required	32	10	40	15
2. Topsoil segregation required.	35	10	40	12
3. Guy wires with no topsoil segregation required.	7	35	15	40
4. Guy wires with topsoil segregation required	10	35	15	37

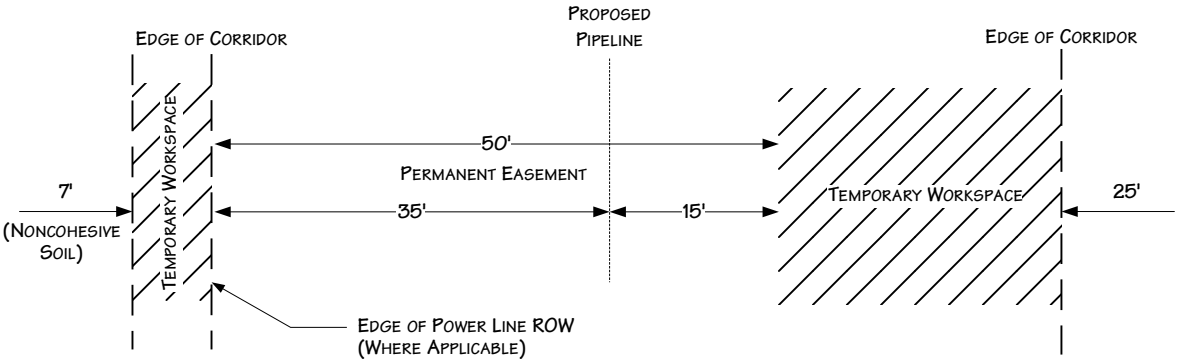
For environmental review purposes only.

Figure 2.2.1-3
Cypress Pipeline Project
Typical Rights-of-Way (ROW)
Mainline in Uplands

Typical and Push-Pull Conditions (No Guy Wires)



Typical and Push-Pull Conditions (Adjacent to Guy Wires)



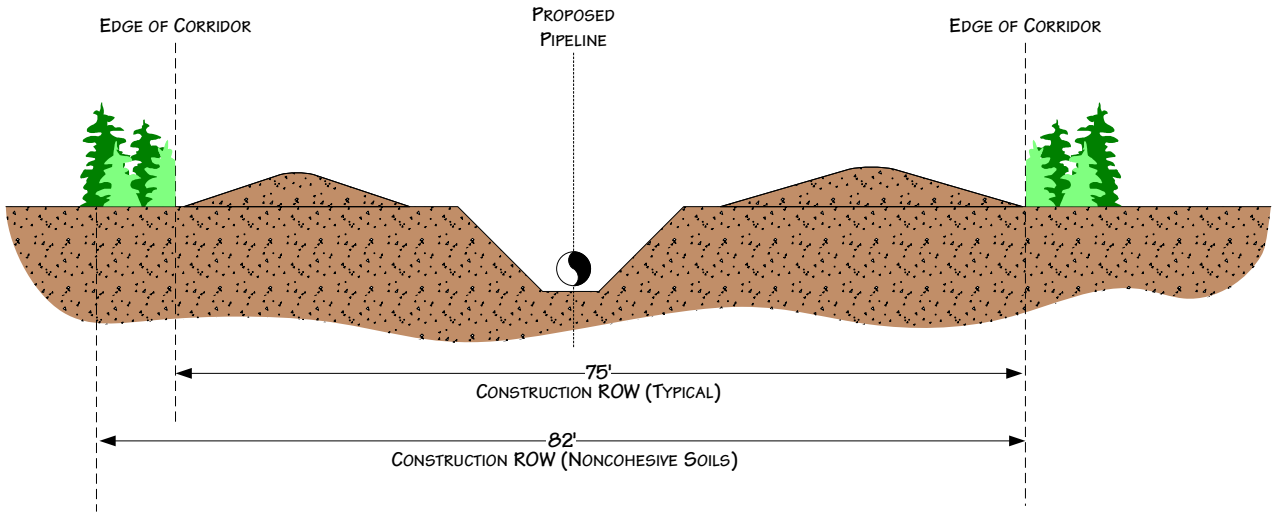


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Figure 2.2.1-4
Cypress Pipeline Project
Typical Rights-of-Way (ROW)
Mainline in Wetlands

TABLE 2.2.1-2

Existing Rights-of-Way Adjacent to the Proposed Cypress Pipeline Project

County/State	Beginning Milepost	Ending Milepost	Segment Length (miles)	Adjacent Right-of-Way (Type) [a]	Approximate Width of Existing (Adjacent) Right-of-Way (Feet)	Overlap of Temporary Construction Right-of-Way (feet) [b]
Loop						
Chatham, Effingham/ GA	95.0	104.8	9.8	Southern (Pipelines)	90	65
Mainline						
Effingham, Chatham/ GA	0.0	9.4	9.4	SEPCO (Power line)	400	55
Effingham, Chatham/ GA	9.4	R19.7	10.9	SEPCO (Power line)	450	55
Chatham/ GA	R19.7	R22.3	2.6	GPC (Power line)	150	32
Chatham/ GA	R22.3	R22.8	0.4	I-95 (Road)	200	None
Bryan/GA	R24.9	R25.7	0.8	Longwood Road	50	None
Bryan/GA	R25.7	R25.9	0.2	Highway 144 (Road)	100	None
Bryan/GA	R26.8	R27.3	0.5	I-95 (Road)	200	None
Bryan/GA	R27.3	22.1	0.5	GPC (Power line)	350	32
Bryan, Liberty/GA	22.1	36.2	14.1	GPC (Power line, Guy Wire Configuration [c])	350	7
Liberty, Long, McIntosh, Glynn/GA	36.2	74.0	37.8	GPC (Power line)	150 - 250	32
Glynn/GA	74.0	75.5	1.5	Existing Access Roads	50	None
Glynn, Camden, Charlton/GA	75.5	104.8	29.3	GPC (Power line)	150 - 350	32
Charlton/GA	105.9	110.0	4.1	GPC (Power line)	150	32
Charlton/GA	110.2	112.5	2.4	Williams/Level 3 (Fiber Optic) / GPC (Power line)	250	32
Charlton/GA	112.5	115.5	2.9	Level 3 (Fiber Optic) / GPC (Power line)	250	32
Total Mainline Length in GA			**117.4**			
Nassau/FL	115.5	143.7	28.3	FPL (Power line)	275	32
Nassau/FL	143.7	144.4	0.7	South Georgia	250	32
Nassau, Duval/FL	144.5	149.8	5.3	FPL (Power line)	250	32
Duval/FL	151.0	151.3	0.3	FPL (Power line)	250	32
Duval/FL	151.7	152.8	1.0	FPL (Power line)	150	32
Duval/FL	152.8	154.2	1.4	TECO (Peoples Gas) Pipeline	500	32
Duval/FL	154.2	157.1	2.9	JEA / FPL (Power line)	500	32

TABLE 2.2.1-2 (cont'd)

Existing Rights-of-Way Adjacent to the Proposed Cypress Pipeline Project

County/State	Beginning Milepost	Ending Milepost	Segment Length (miles)	Adjacent Right-of-Way (Type) [a]	Approximate Width of Existing (Adjacent) Right-of-Way (feet)	Overlap of Temporary Construction Right-of-Way (feet) [b]
Duval/FL	157.1	158.3	1.2	TECO (Peoples Gas) Pipeline	150	32
Clay/FL	159.3	159.8	0.5	FGT (Pipeline)	50	32
		Total length in FL	41.6			
		Total Mainline length	159.0			
Total Pipeline (loop and mainline) length adjacent to existing rights-of-way			168.8			

[a] Adjacent rights-of-way operated and maintained by: Savannah Electric Power Company (SEPCO), Georgia Power Company (GPC), Interstate-95 (I-95), Williams Communications (Williams), Level 3 Communications (Level 3), Florida Power and Light Company (FPL), South Georgia Natural Gas (South Georgia), and Jacksonville Electric Authority (JEA).

[b] Proposed width of overlap where no topsoil segregation is required. Southern would add 3 additional feet of overlap if topsoil segregation is required.

[c] Guy wires extend to the edge of the existing power line rights-of-way between MPs 22.1 and 32.9 (about 10.8 miles) and between MPs 33.4 and 36.1 (about 2.7 miles).

Extra Workspaces, Yards, and Access Roads

Southern would disturb about 60.3 acres associated with the 350 extra workspaces proposed to be used for specialized construction procedures, primarily for road, waterbody, and wetland crossings. The extra workspaces that would be used are listed in table C-1 in Appendix C, with a description of the approximate dimensions, total acreage, and existing land use that would be affected. Upon completion of construction, extra workspaces would not be needed for operation.

Southern would use about 157.3 acres of land for warehouse yards and pipe yards. These yards are listed in table C-1 in Appendix C with a description of the approximate yard acreage and existing land use that would be affected. Upon completion of construction, yards would not be needed for operation and would be restored to the extent practicable and allowed to revert to the previous land use.

Construction equipment would travel on the working side within the pipeline construction right-of-way, and use existing roads to access the pipeline construction right-of-way and aboveground facility construction areas. Southern identified only four temporary access roads that could potentially require improvements to be useable, and those improvements were associated with stream crossings (e.g., replacement or installation of culverts, reinforcement of existing bridge), as listed in table C-2 in Appendix C. The potential for access roads to impact waterbodies is further evaluated in section 4.3.2.

Southern proposes to construct eight new permanent access roads to selected block valve and meter station sites as summarized in table 2.1.1-3. The permanent access roads would be about 15-foot-wide and generally located within the permanent right-of-way for the mainline; therefore, no additional land would be required beyond that already described for the permanent right-of-way. One permanent access road associated with MLV 4 at about MP R25.6 near the Fort Stewart Military Reservation in Bryan County, Georgia would require less than 0.1 acre of new permanent right-of-way. In addition, the permanent access for the FGT Meter Station at about MP 159.8 in Duval County, Florida, would use an existing Florida Power and Light Company (FPL) maintenance road on the western edge of the FPL corridor between Longbranch Road and the FGT Meter Station. Permanent use of these two roads would require about 1.3 acres of new permanent right-of-way.

2.2.2 FGT Expansion Project

Construction of the proposed FGT Expansion Project would disturb about 551.6 acres of land, including the pipeline construction right-of-way, temporary extra workspace, access roads, storage/contractor yards, and the aboveground facilities. Of this total, about 409.5 acres would be disturbed by the pipeline construction right-of-way, 47.5 acres would be disturbed by temporary extra workspace, 9.5 acres would be disturbed by access roads, and 59.3 would be disturbed by storage/contractor yards. The aboveground facilities would affect 25.8 acres.

FGT proposes to use about 160.9 acres for operation of the project. Of this total, 152.7 acres would be permanent pipeline right-of-way, 5.9 acres would be for the aboveground facilities, and 2.3 acres would be retained for access roads. FGT would restore the remaining 390.7 acres of land and allow this land to revert to its former use. Table 2.2.2-1 summarizes the land requirements for the FGT Expansion Project.

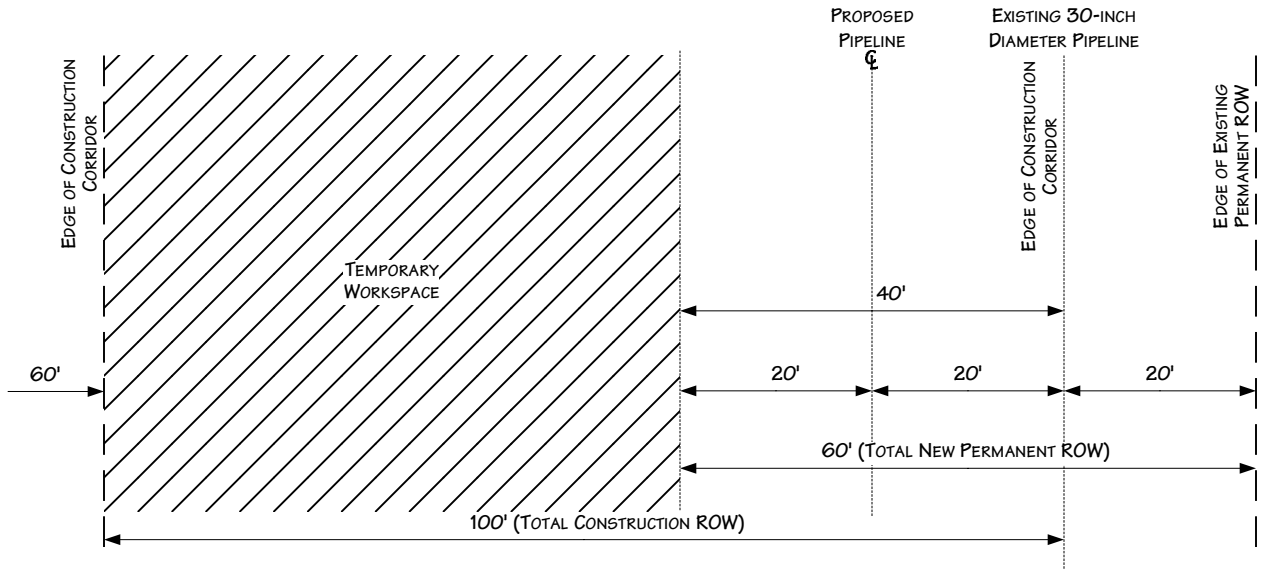
TABLE 2.2.2-1

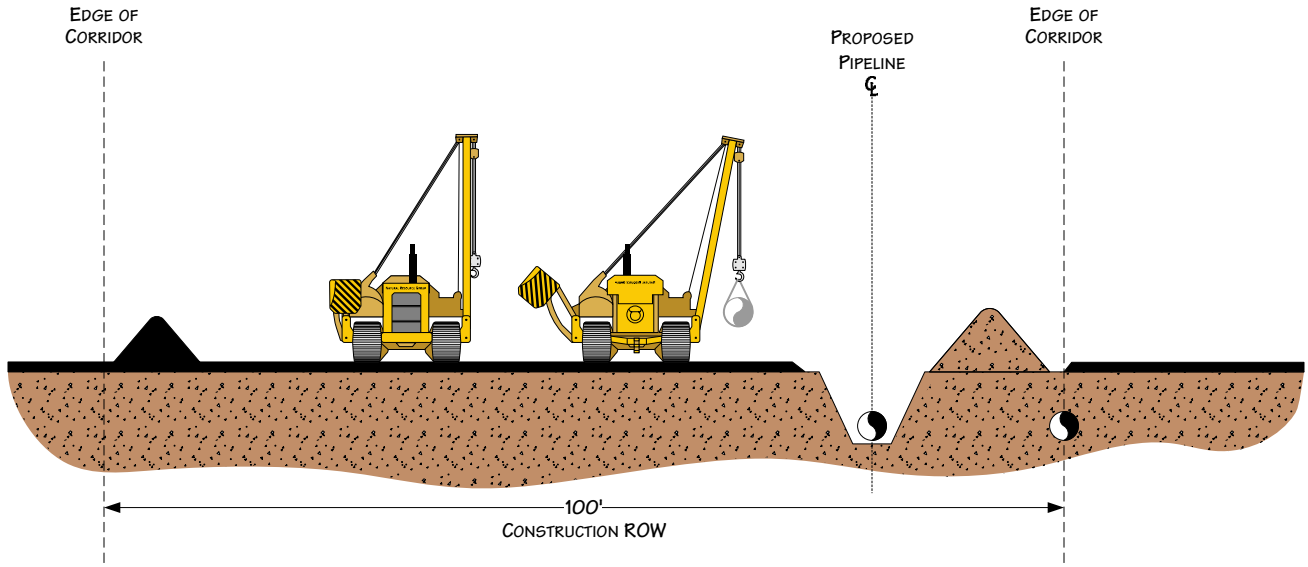
Summary of Land Requirements Associated with the FGT Expansion Project

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Facilities		
Loop K	67.5	24.4
Loop J	168.5	75.4
Loop G	173.5	52.9
Pipeline Facilities Total	**409.5**	**152.7**
Aboveground Facilities [b]		
Compressor Station 26	5.0	0.0
Compressor Station 24	0.0	0.0
Compressor Station 16	6.0	0.0
Compressor Station 17	2.0	0.0
Compressor Station 27	0.0	0.0
Cypress/FGT Interconnect	0.4	0.2
Long Branch Regulator Station	3.5	2.5
Hines M&R Station	2.2	0.1
Brandy Branch M&R Station	1.1	<0.1
Jacksonville M&R Station	0.4	0.0
Lawtey Regulator Station	1.1	<0.1
Loop K Remote Blowdowns	2.7	2.0
Loop G Remote Blowdowns	1.4	1.1
Aboveground Facilities Total	**25.8**	**5.9**
Extra Workspaces	47.5	0.0
Access Roads	9.5	2.3
Storage/Contractor Yards	59.3	0.0
Project Total	**551.6**	**160.9**

Pipeline Rights-of-Way

FGT proposes to install Loops J and K typically about 20 feet from its existing 30-inch-diameter pipeline or from the edge of adjacent rights-of-way, where present. Loop J would be installed on the west side of FGT's existing pipeline, and Loop K would be installed primarily on the east side. FGT has existing pipeline for the entire length of Loop J and for about 15 of the 15.2 miles of Loop K. On Loop J, FGT currently has a 40-foot-wide permanent easement and would add 20 feet of additional permanent right-of-way for its new pipeline (see figure 2.2.2-1). On Loop K, FGT currently has a 30-foot-wide permanent easement and would obtain 40 feet of new permanent right-of-way (see figures 2.2.2-2 and 2.2.2-3).

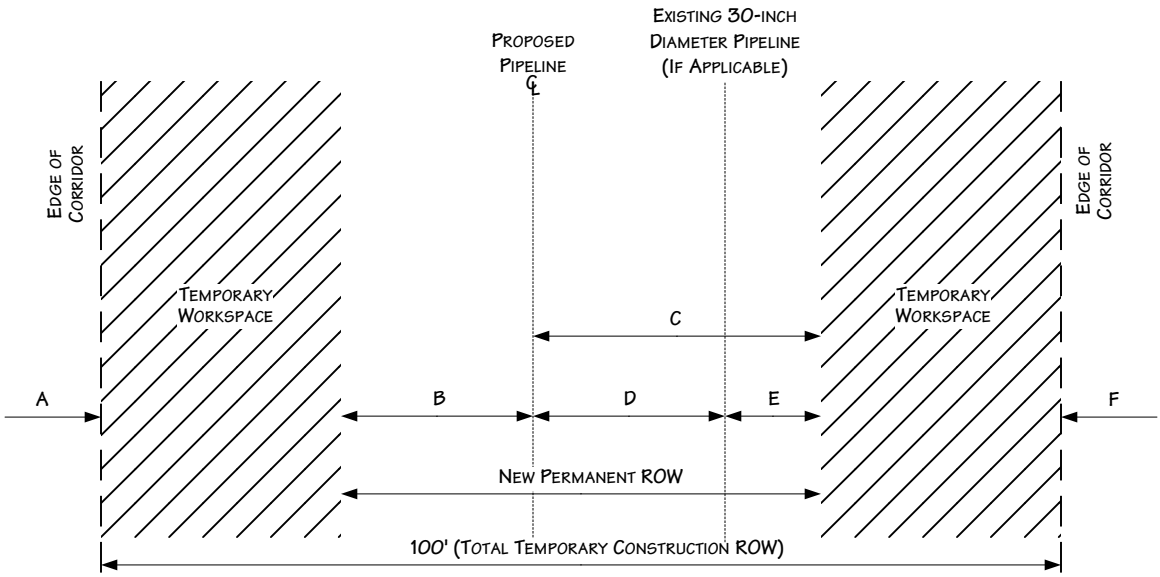


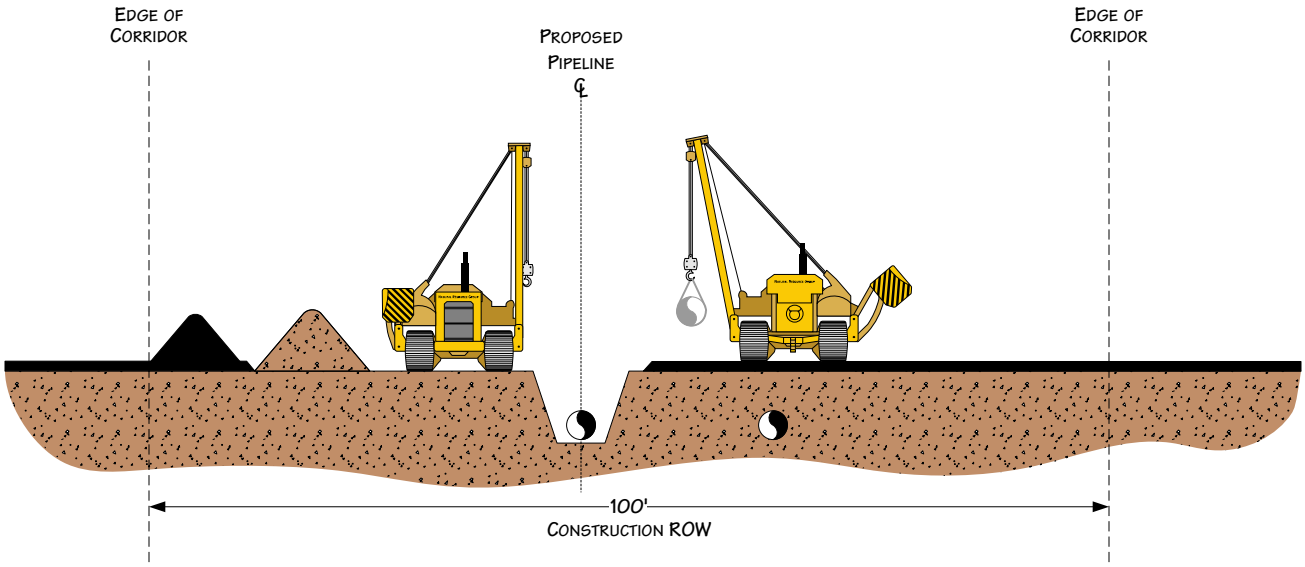


ROW = Right-of-Way
℄ = Centerline

For environmental review purposes only.

Figure 2.2.2-1
FGT Expansion Project
Typical Rights-of-Way
Loop J





Loop K	Temporary Workspace A	Offset to new permanent ROW B	Offset to new permanent ROW C	Offset from existing pipeline D	Offset to existing permanent ROW E	Temporary Workspace F
1. MP 38.5 – 38.9	5	20	20	N/A	N/A	55
2. MP 38.9 – 39.3	55	20	N/A	20	10	0
3. MP 39.3 – 53.6	40	15	N/A	20	10	15

N/A = Not Applicable
ROW = Right-of-Way
℄ = Centerline

For environmental review purposes only.

Figure 2.2.2-2
FGT Expansion Project
Typical Rights-of-Way
Loop K in Uplands

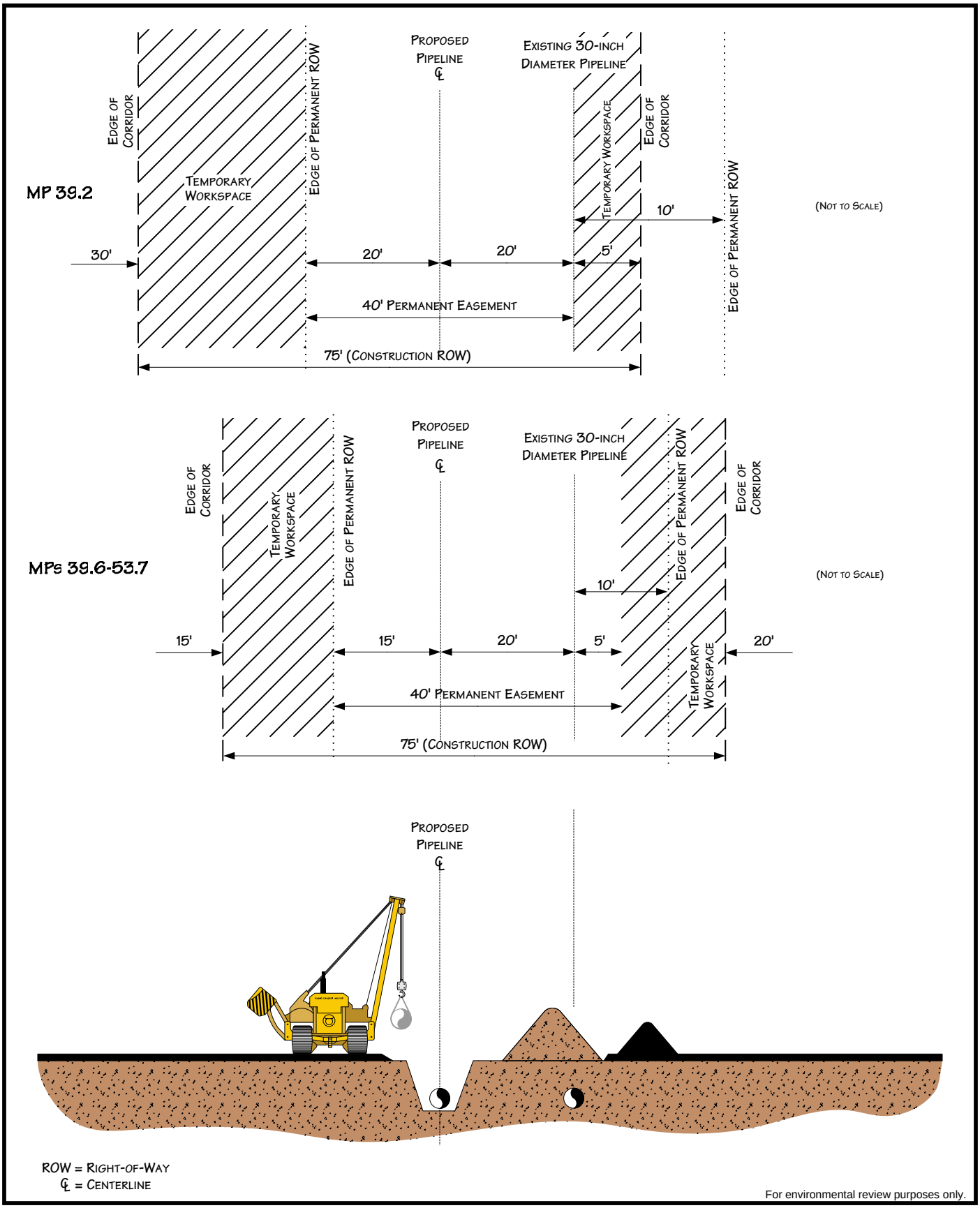


Figure 2.2.2-3

FGT Expansion Project

Typical Rights-of-Way

Loop K in Wetlands

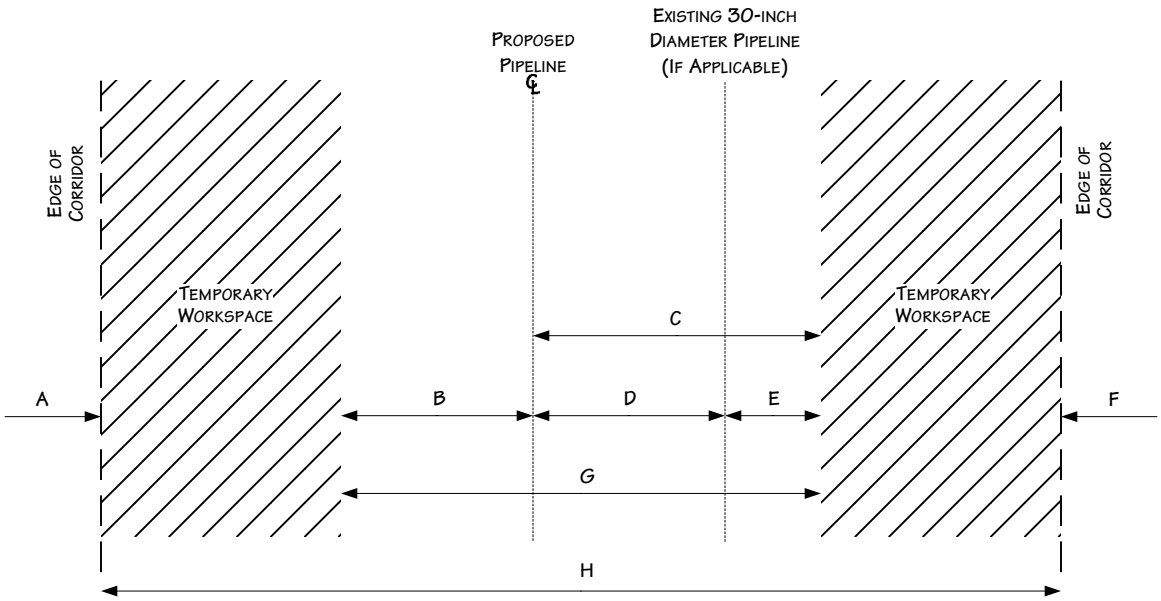
FGT proposes to collocate Loop G within an existing FPL right-of-way. The northern 6.3 miles (north of Scrub Oak Lane) would be installed about 15 feet inside the eastern edge of FPL's right-of-way, and the southern 6.1 miles would be installed about 10 feet east of FGT's existing 30-inch-diameter pipeline on the western side of FPL's right-of-way. For the portions of Loop G that would not be adjacent to existing FGT facilities (the northern 6.3 miles), FGT proposes to establish a new 30-foot-wide permanent right-of-way centered on the new pipeline. For the portions of the loop that would be adjacent to FGT's existing 30-inch-diameter pipeline (the southern 6.1 miles) FGT would increase its existing permanent right-of-way by 15 feet to become a 40-foot-wide permanent right-of-way for both pipelines. Figure 2.2.2-4 depicts FGT's typical permanent and temporary construction right-of-way configurations for Loop G.

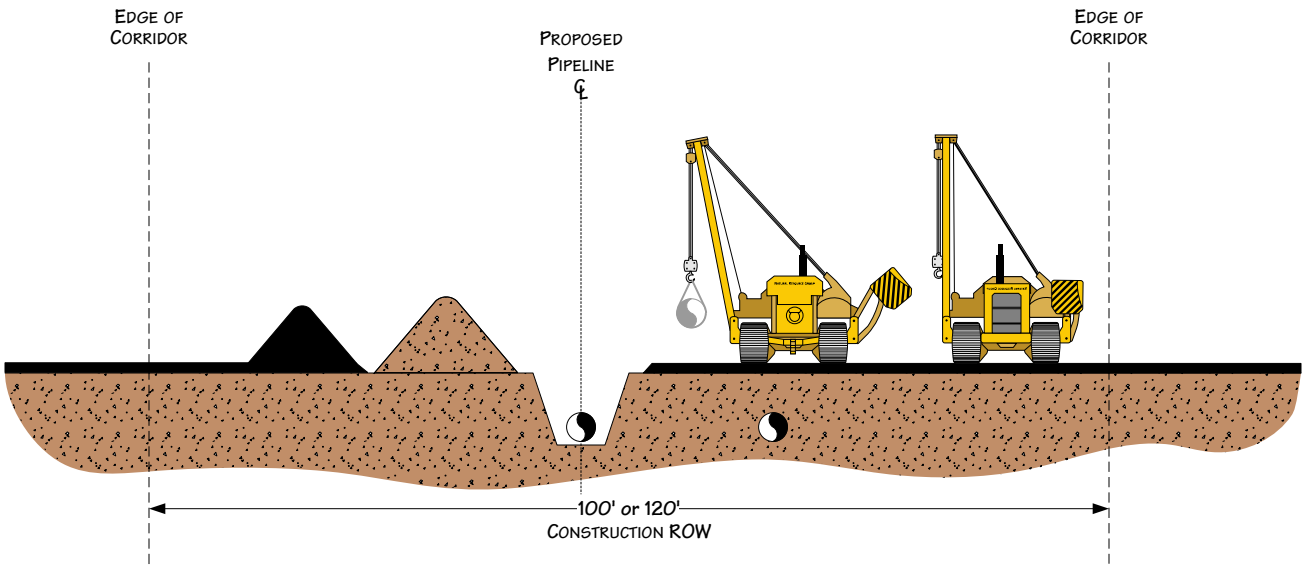
FGT's temporary construction right-of-way in uplands would typically be 100 feet wide on loops J, K, and G. Loops J and G do not cross wetlands. Where Loop K is constructed in wetlands, FGT would restrict the temporary workspace to 75 feet wide (see figure 2.2.2-3). The temporary construction workspace for Loop J would overlap FGT's existing permanent easement by 20 feet in uplands and use 80 feet outside the existing permanent right-of-way, of which 20 feet would become new permanent easement and 60 feet would be temporary workspace. The temporary workspace for Loop K would typically use all of FGT's existing and proposed new permanent easement, plus typically 55 or 35 feet of temporary workspace, on one or both sides extending outside existing or new permanent easement, in uplands or wetlands, respectively. On the northern 6.3 miles of Loop G, FGT would use a construction right-of-way that includes a 70-foot-wide temporary workspace plus a 30-foot-wide new permanent easement, all within FPL's existing easement. On the southern 6.1 miles of Loop G, FGT would use its 40-foot-wide existing permanent right-of-way that currently overlaps on FPL's maintained right-of-way. In addition, the portions of the route north of State Road 50 (Cortez Boulevard), FGT would use 60 feet of temporary workspace that would consist of 24 feet outside (west of) the existing FGT/FPL easement and 36 feet inside the existing FPL easement. For the portion of Loop G that is south of State Road 50, FGT's temporary workspace would be 60 feet wide located entirely within the existing FPL easement.

Aboveground Facilities

FGT's proposed aboveground facilities would all be constructed within existing facility sites. The land affected during construction of aboveground facilities would total about 25.8 acres and require about 5.9 acres for permanent operation of the facilities. The additional 7,800 hp of compression to be added at Compressor Station 26 would be housed in the existing compressor building; however, the building would be expanded by about 6 feet on one end. The cooling equipment and rewheeling of two other existing compressor units would also occur within existing buildings. No new permanent right-of-way would be required outside the existing facility site, and about 5.0 acres of land would be affected by construction, all within the existing facility fence line.

FGT's upgrades at Compressor Station 24 and 27 would be performed within the existing sites and no excavation or ground disturbance would be necessary. The modification of suction piping at Compressor Station 16 and reworking of two compressor piston/pockets would require about 6.0 acres of land during construction, but all work would occur within the existing site and no new permanent right-of-way would be required. FGT's proposed installation of a chromatograph at Compressor Station 17 would affect about 2.0 acres of land during construction but no new permanent right-of-way outside the existing facility fence line.





Loop G	Temporary Workspace A	Offset to new permanent ROW B	Offset to Existing Property Easement Line C	Offset from existing pipeline D	Offset to existing ROW E	Temporary Workspace F	Total new permenant ROW G	Total construction ROW H
1. MP 104.9 – 105.0	20	10	20	N/A	N/A	70	30	120
2. MP 105.0 – 110.6	N/A	15	15	N/A	N/A	70	30	100
3. MP 110.6 – 110.9	20	15	15	N/A	N/A	70	30	120
4. MP 110.9 – 113.6	36	15	N/A	10	15	24	40	100
5. MP 113.6 – 117.0	60	15	N/A	10	15	N/A	40	100

N/A = Not Applicable
ROW = Right-of-Way
℄ = Centerline

For environmental review purposes only.

Figure 2.2.2-4
FGT Expansion Project
Typical Rights-of-Way
Loop G

The installation of the side valve, MLV, interconnect piping, electronic flow measurement, overpressure protection, and a gas odorizer at the Cypress/FGT Interconnect in Clay County would require about 0.4 acre for construction and about 0.2 acre for operation. The new Long Branch Regulator Station in Clay County would affect about 3.5 acres for construction and require 2.5 acres of new permanent right-of-way for operation. Replacement of regulators and installation of new ultrasonic meter tubes and a coalescing filter separator at the Hines M&R facilities in Polk County would require a 400-foot by 400-foot temporary workspace (about 2.2 acres) and permanent expansion of the existing fenced site from its current dimensions of about 90 feet by 85 feet to about 130 feet by 110 feet. FGT's Brandy Branch M&R facility in Bradford County would require about 1.1 acres for construction, including a 150-foot by 190-foot laydown area, and a 75-foot by 300-foot truck turn-around. As part of the dual probe chromatograph installation, one probe would be installed within the existing site, and one would be located adjacent to the existing fenced site. In addition, a sampling line would be installed from a sampling point on FGT's existing Jackson Lateral pipeline. As a result, about <0.1 acre of new permanent right-of-way would be required for the new Brandy Branch M&R facilities.

FGT's installation of a chromatograph at its Jacksonville M&R facility in Duval County would temporarily affect about 0.4 acre of land within the existing fenced site and would not require new permanent right-of-way. The proposed modifications to the Lawtey Regulator Station in Bradford County to allow bi-directional flow would require about 1.1 acres for construction, including a 150-foot by 190-foot laydown area, and a 75-foot by 300-foot truck turn-around. Permanent operation of the Lawtey Regulator Station would require about <0.1 acre of new permanent right-of-way.

The construction of FGT's new remote blowdown facilities would temporarily impact a total of about 4.1 acres of land and would require a new permanent right-of-way that would total about 3.1 acres of land. The Loop K remote blowdown facilities at about MPs 44.5 and 53.7 on FGT's West Leg pipeline in Levy County would require about 1.4 acres and 1.3 acre of land for construction, respectively, and about 1.0 acre each for operation. The Loop G remote blowdown facilities at about MPs 110.9 and 117.0 on FGT's West Leg pipeline in Hernando County would require about 0.7 acre each for construction, and about 0.5 and 0.6 acre, respectively, for operation.

Extra Workspaces, Yards, Access Roads

FGT would disturb about 47.5 acres associated with the 102 temporary extra workspaces proposed to be used for its project. A list of the extra workspaces including dimensions and existing land uses that would be impacted are provided in table C-3 of Appendix C. Following construction, the extra workspaces would not be required for operation of the facilities, and would be allowed to revert to the original land uses.

FGT would use about 59.3 acres of land for contractor yards and pipe yards. These yards are listed in table C-4 in Appendix C with a description of the approximate yard acreage and existing land use that would be affected. Upon completion of construction, yards would not be needed for operation and would be restored to the extent practical and allowed to revert to the previous land use.

Temporary access to FGT's pipeline and aboveground facility construction areas would be from existing public and selected private roads that intersect the proposed pipeline construction right-of-way. FGT identified 10 roads as listed in table C-5 in Appendix C that would require improvements, principally grading, to make them suitable for use during construction. Of those 10 roads, 4 would become new permanent access roads to the proposed FGT remote blowdown sites. Access road improvements would affect a total of about 9.5 acres of land, and the use of four of the roads to permanently access the remote blowdown sites would require a total of about 2.3 acres. In addition, at the Cypress/FGT Interconnect, FGT would use the permanent access road that is proposed to be used by

Southern to access its FGT Meter Station, or may temporarily access the site from Long Branch Road along about 3,738 feet of FGT's existing Jacksonville Lateral pipeline right-of-way.

2.3 CONSTRUCTION PROCEDURES

Southern's and FGT's facilities would be designed, constructed, tested, operated, and maintained in accordance with applicable requirements included in the U.S. Department of Transportation (DOT) regulations in Title 49 CFR Part 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*; and other applicable federal and state regulations including U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) requirements. These regulations are intended to ensure adequate protection for the public and to prevent natural gas pipeline accidents and failures. Among other design standards, Part 192 specifies pipeline material selection, minimum design requirements, and protection from internal, external, and atmospheric corrosion, and qualification procedures for welding and operations personnel.

To minimize construction impacts, Southern and FGT would implement FERC staff's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures),[2] but with some modifications. The Plan and Procedures are provided in Appendix D and E, respectively. Southern's and FGT's requested modifications are called out in each document with reference to where the modifications are evaluated in this EIS and our determination for whether each modification is approved or denied.

Southern and FGT have also developed other project-specific plans to avoid or minimize environmental impacts during construction. Southern's project-specific plans are listed below with references to where the plans are discussed or included in this document:

- Spill Prevention, Containment, and Control Plan (SPCC Plan), including a Waste Management Plan and Container Management Policy (see section 4.2.3 and Appendix F-1)
- Horizontal Directional Drilling Contingency Plan and Feasibility Assessment (HDD Plan) (see section 4.3.3 and Appendix F-2)
- Sensitive Species Mitigation Plans (see section 4.7)
- Residential Construction Mitigation Plans (see sections 2.3.2 and 4.8.3)
- Unexpected Discoveries and Emergency Procedures Plan (see section 4.10.2)

FGT's project-specific plans are listed below with references to where the plans are discussed or included in this document:

- Program for Recognizing and Reporting Paleontological Resources (see section 4.1.4 and Appendix G-1)
- Unanticipated Discoveries of Contaminated Soils (see section 4.2.3 and Appendix G-2)

[2] The FERC staff's Plan and Procedures are a set of construction and mitigation measures that were developed in collaboration with other federal and state agencies and the natural gas pipeline industry to minimize the potential environmental impacts of the construction of pipeline projects in general. Proper implementation of the Plan and Procedures would adequately minimize construction-related impacts on soils, waterbodies, and wetlands.

- Unanticipated Discoveries Plan (see section 4.10.2)

- Residential Construction Mitigation Plans (see sections 2.3.2 and 4.8.3)

2.3.1 General Pipeline Construction Procedures

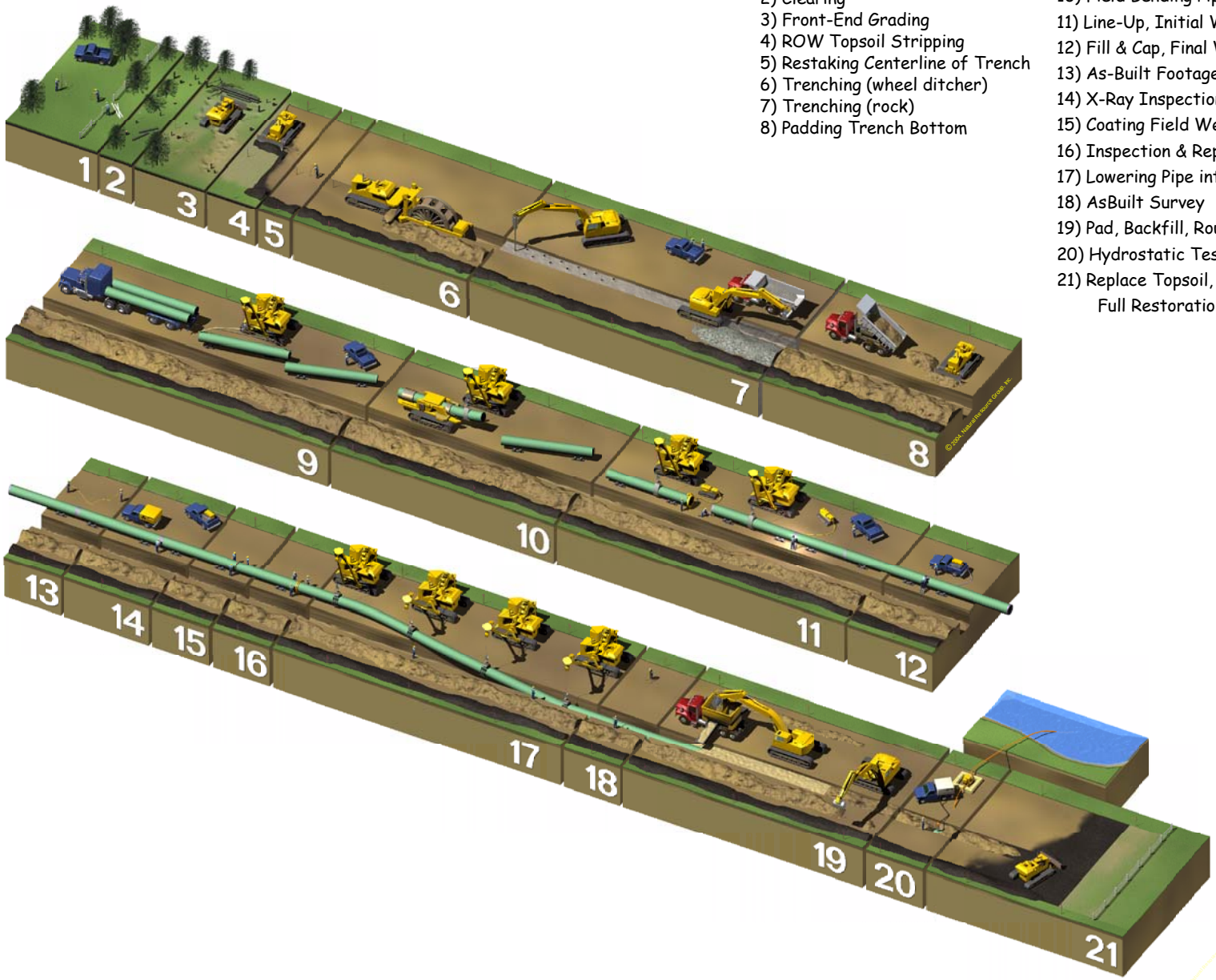
Southern would construct the mainline using two general construction crews or "spreads" and would use one spread for the loop. Construction spreads typically utilize independent contractors or construction and management teams that would have construction responsibilities specific to only that spread. FGT did not specify if separate spreads would be used, however, due to the distance between some portions of the project from each other, and the varied types of facilities that would be constructed, it is anticipated that FGT may utilize more than one construction contractor.

Standard pipeline construction proceeds in the manner of an outdoor assembly line composed of specific activities that make up the linear construction sequence. These operations collectively include survey and staking of the right-of-way, clearing and grading, trenching, pipe stringing, bending, welding, lowering the pipeline into the trench, backfilling the trench, hydrostatic testing, and right-of-way cleanup and restoration. Each of these steps is discussed further in the subsections, below. In addition, section 2.3.2 discusses special construction techniques Southern and FGT would use when crossing roads, highways, and railroads; waterbodies, wetlands, and residential areas. Also, sections 4.0 and 5.0 provide detailed discussions of proposed construction and restoration procedures as well as additional measures that we are recommending to mitigate environmental impacts on specific resources or areas.

Figure 2.3.1-1 shows the typical steps of cross-country pipeline construction that would occur on each spread, particularly in upland terrain. In the typical pipeline construction scenario, the construction spread (crew) would proceed along the pipeline right-of-way in one continuous operation. As the spread moves along, construction at any single point along the pipeline, from initial surveying and clearing to backfilling and finish grading, would last about 6 to 10 weeks. The entire process would be coordinated in such a manner as to minimize the total time an individual tract of land is disturbed and, therefore, exposed to erosion and temporarily precluded from its normal use. Southern and FGT do not anticipate that any area along the proposed pipeline would require blasting. However, if outcrops or substrates of hard rock are encountered that mechanical rippers and excavators cannot fracture, blasting could be required and would be done in accordance with pertinent regulations and our Plan and Procedures (see Appendices D and E, respectively).

Survey and Staking

The first step of construction for Southern and FGT would involve marking the limits of the approved work area (i.e., the construction right-of-way boundaries and temporary extra workspaces) as well as the pipeline centerline, access roads, existing utility lines and special areas, as applicable. Sensitive areas such as wetland boundaries, cultural resource sites, and sensitive species habitat to be avoided would be marked with appropriate flagging based on environmental and archeological surveys. Affected landowners would be notified before survey and staking activities begin. Also, Southern has indicated that before construction begins, one-call systems for affected states would be contacted in order to have buried utilities identified and flagged.



1) Survey and Staking
2) Clearing
3) Front-End Grading
4) ROW Topsoil Stripping
5) Restaking Centerline of Trench
6) Trenching (wheel ditcher)
7) Trenching (rock)
8) Padding Trench Bottom
9) Stringing Pipe
10) Field Bending Pipe
11) Line-Up, Initial Weld
12) Fill & Cap, Final Weld
13) As-Built Footage
14) X-Ray Inspection, Weld Repair
15) Coating Field Welds
16) Inspection & Repair of Coating
17) Lowering Pipe into Trench
18) AsBuilt Survey
19) Pad, Backfill, Rough Grade
20) Hydrostatic Testing, Final Tie-in
21) Replace Topsoil, Final Clean-Up, Full Restoration

Figure 2.3.1-1
Cypress Pipeline Project
Typical Steps of Cross-Country Pipeline Construction

This information is for environmental review only.

Clearing and Grading

Following survey and staking, the clearing crew would clear the right-of-way of vegetation and obstacles (e.g., trees, logs, brush, roots, stumps, rock). Crops and other non-woody vegetation may be mowed while other crops, such as those with small grains, may be left in place to limit soil erosion. Timber would only be removed when absolutely necessary for construction purposes. Non-merchantable timber and other vegetative debris would be burned, chipped, or otherwise disposed in accordance with state and local regulations, and landowner agreement at licensed disposal facilities. Stumps may be buried only in non-tilled land on the construction right-of-way and only with the agreement of the appropriate landowner.

Once the right-of-way is cleared, it would be graded where necessary to create a reasonably level surface for trench excavating equipment and a sufficiently wide workspace for the passage of heavy construction equipment. Existing fences would be cut and braced as necessary and temporary fencing or gates would be installed to contain livestock if present. The fence crew would also install temporary construction fence to mark sensitive areas to be avoided.

Topsoil would be graded to the edge of the right-of-way and stored separate from subsoil in residential areas, agricultural lands, pastures, hayfields, and other areas at the landowner's request, leaving the other side of the right-of-way (working side) to be used for access, materials transport, and pipe assembly. Landowners would be offered the option of full width or ditch-plus-spoil-side topsoil segregation as illustrated on figure 2.2.1-3. Topsoil would be removed to its actual depth or to a maximum depth of 12 inches. Topsoil segregation is discussed further in section 4.2.3.

Temporary erosion controls would be installed immediately after the initial disturbance of the soil and maintained throughout construction. These measures would contain disturbed soils on the construction right-of-way and minimize the potential for sediment from upland soils to enter wetlands or waterbodies.

Trenching

Rotary wheel ditching machines, backhoes, or rippers would be used to excavate the trench. The trench would be excavated to allow at least the minimum cover required by DOT specifications. Typically, the trench would be deep enough to allow for a minimum of 3 feet of cover over the pipeline in all class location areas, with a few exceptions. In agricultural areas, FGT could allow 4 feet of cover. In areas of rock substrate, Southern could allow a minimum of 18 inches of cover for class I (unpopulated) areas and 24 inches of cover for class II and III (more populated) areas. Southern anticipates its trench width for the mainline would be 8 to 14 feet wide in uplands, and would be 10 to 14 feet wide for the loop, depending on soil stability. In wetlands, Southern anticipates its trench width would range from 14 to 20 feet wide. FGT anticipates its trench width would range from 12.5 feet wide in stable uplands to 25 feet wide in wetlands where sandy, unstable soils could cave in or slough during trenching. Neither Southern nor FGT anticipate the need for blasting. However, if outcrops or substrates of hard rock are encountered that mechanical rippers and excavators cannot fracture, blasting could be required and would be done in accordance with pertinent regulations and our Plan and Procedures (see Appendices D and E, respectively). When crossing a utility or foreign pipeline, the pipelines would generally be at a greater depth, allowing a 12-inch minimum clearance, or a depth in accordance with state and local regulations, whichever provides greater protection.

Spoil from the trench would typically be stored temporarily on the non-working side of the right-of-way, away from the construction traffic and pipe assembly area. Where Southern's and FGT's proposed loops are adjacent to their existing pipelines, the spoil may be placed over the existing pipelines

and easements. Working equipment would generally operate on the opposite side of the trench from spoil storage areas (on the "working" side) and would generally not work over operating pipelines except to replace spoil to the trench and right-of-way after pipeline installation.

Pipe Stringing, Bending, and Welding

Steel pipe would be procured in 40- or 80-foot-long lengths, protected with epoxy coating applied at the factory, and shipped to strategically located materials storage areas or pipe yards. The pipe would be transported to the right-of-way by stringing trucks, which would typically be semi-tractor trailers carrying segments of pipe over public road networks and authorized private access roads to the right-of-way, and would be placed or "strung" along the trench in a continuous line on the working side of the trench.

All bending, welding and coating in the field would comply with Title 49 CFR Part 192. Selected pipe segments would be field bent by track mounted hydraulic bending machines as necessary to fit the contours of the trench. The pipe joints would then be aligned, welded together into long strings, and placed on temporary supports along the edge of the trench. Only experienced welders highly proficient in pipeline welding and qualified according to applicable American Welders Society, American Society of Mechanical Engineers (ASME), and American Petroleum Institute (API) Standards would be used. To ensure the assembled pipe would meet or exceed the design strength requirements, each weld would be visually and radiographically inspected (i.e., x-ray), or inspected by alternative nondestructive testing methods (i.e., ultrasound), or other approved methods, by qualified inspectors in accordance with ASME standards. Welds that do not meet established specifications would be repaired or removed. Once the welds are approved, the welded joints would be coated with a protective coating to protect the pipeline from corrosion.

Lowering-in, Padding, and Backfilling

Before the pipe is lowered into the trench, the trench would be inspected for and cleaned of debris that could damage the pipe. In areas of rock, padding material such as sand or rock-free subsoil would be used to prevent damage to the pipe and pipe coating. Topsoil would not be used for padding. In areas where the trench has filled with groundwater and/or rainwater, dewatering could be necessary and would be done in accordance with applicable local, state, and federal requirements. Southern and FGT would pump the water from the trench into stable upland areas or into sediment filtration/energy dissipation devices if stable upland areas are not available. Once the trench is cleaned of debris and dewatered, the pipe would be lowered into the trench. After lowering-in the pipe, trench breakers (sand bag or foam-type) would be installed at specified intervals to prevent subsurface water movement along the pipeline. The trench would then be backfilled using the previously excavated materials. Where the previously excavated material contains large rock or other materials that could damage the pipe and coating, clean fill or protective rock shields would be placed around the pipe prior to backfilling. Backfilling would occur to grade or higher to accommodate any future soil settlement.

Hydrostatic Testing

After backfilling, all of the new pipeline would be hydrostatically tested in accordance with DOT regulations to ensure the system is capable of withstanding the operating pressure for which it was designed. Hydrostatic testing entails installing a hydrostatic test cap and manifold, pumping water into the test section, pressurizing the pipe to its maximum allowable operating pressure (MAOP), and maintaining that pressure for a specific time period. Testing would be performed on the entire pipeline typically by testing individual pipe sections along the length of the pipeline, and test water would be obtained from various approved surface waters, municipal sources, or through specific agreements with

landowners and in accordance with federal, state, and local regulations as described in section 4.3.2. No chemicals would be added to the test water. If leaks are found, they would be repaired, and the section of pipe would be retested until specifications are met.

After testing, the water would either be pumped into the next test section to be used again, or would be discharged into a dewatering structure located in upland areas at a significant distance from wetlands, waterbodies, or sensitive areas to promote infiltration and prevent sedimentation in wetlands, waterbodies, or other sensitive areas. The dewatering structures would be constructed in accordance with our Procedures (Appendix E), and applicable permits. No discharges would be directly into waterbodies. If it is not feasible to discharge as described above, Southern and FGT would need to obtain applicable state permits.

Once a segment of pipe has been successfully tested the pipeline would be cleaned and dried using mechanical tools (pigs) that are moved through the pipeline with pressurized, dry air. Upon completion of cleaning and drying, the hydrostatic test cap and manifold would be removed from the pipeline, and the pipe would be connected to the remainder of the pipeline.

Cleanup

Work areas would be final graded and restored as near as practicable to pre-construction contours. To minimize future settling, the trench would either be compacted with tracked construction equipment or crowned with soil in a manner that would compensate for settling but not interfere with natural drainage. Surplus construction material and debris would be removed and disposed of at approved sites in accordance with applicable regulatory requirements. Where topsoil was segregated, it would be uniformly spread back over the construction right-of-way.

Access roads would be restored to pre-construction conditions unless otherwise specified by the property owner and approved by applicable regulatory agencies. Private and public property, such as fences, gates, driveways, and roads that were disturbed by construction would be restored to original or better condition consistent with individual landowner agreements.

Permanent erosion control measures would be installed and maintained as specified in our Plan and Procedures (Appendices D and E, respectively). As part of permanent erosion controls, seeding would be conducted in accordance with the prescribed dates and seed mixes (described in greater detail in section 4.5.2 and Appendix D) specified by the local soil conservation authorities, the land management agency, or the landowner.

Pipeline markers and/or warning signs would be installed along the pipeline right-of-way at specified intervals to identify Southern or FGT as the operator of the pipeline and provide telephone numbers for emergencies and inquiries.

2.3.2 Special Construction Techniques

Construction across roads, highways and railroads, and waterbodies, wetlands, and residential areas, would involve additional, special construction techniques which are described in general below.

Road, Highway, and Railroad Crossings

Construction across paved and unpaved roads, highways, and railroads would be in accordance with requirements of applicable crossing permits and approvals. Railroads and major public roads generally would be crossed by Southern and FGT using the conventional bore method (see figure

2.3.2-1). Boring requires the excavation of deep pits on each side of the feature to be crossed and extra workspace to store pit spoil. The pits would be sufficiently deep to contain boring equipment that would bore a horizontal hole under the feature at the required depth. Pipelines would typically be installed at least 5 feet below road or railroad surfaces and would be designed to withstand anticipated external loadings. For long crossings, multiple pipe sections may be required and would usually be welded one at a time as the pipe is being pushed through the borehole. Pipe would be pushed through the borehole with or without a casing depending on permitting requirements. During boring, there would be little or no disruption to road or railroad traffic. The major roads crossed by the Cypress Pipeline and FGT Expansion Projects and the proposed crossing methods are listed in table 4.8.4-1 in section 4.8.4.

Southern proposes to cross several roads and two railroads using the horizontal directional drill (HDD) method, which is similar to the conventional bore in that there would be little or no disruption to traffic. The HDD method is a specialized method that can be used to minimize impacts when the conventional bore method is not feasible due to an extended crossing length or when other site limitations such as sensitive waterbodies or wetlands exist. The HDD method is described in detail as one of the waterbody crossing construction procedures, below. The following roads and railroads would be crossed by the HDD method:

- Bush Road, in conjunction with the HDD crossing of the Savannah-Ogeechee Canal in Chatham County, Georgia;
- State Highway 32, in conjunction with the HDD crossing of Little Buffalo Creek Swamp in Glynn County, Georgia;
- Atlantic Coastline Railroad in conjunction with the HDD crossing of an adjacent wetland in Glynn County, Georgia; and
- Seaboard Airline Railroad and U.S. Highway 200/State Highway 301 in Nassau, Florida.

Most smaller or unpaved private roads would be open cut where permitted by local authorities and private landowners. Southern and FGT would take measures at open-cut crossings to ensure safety and minimize traffic disruptions. The open-cut method would require temporary closure of the roads to traffic and establishment of detours. If no reasonable detour is feasible, at least one lane of the road would remain open to traffic except during brief periods when it is essential to close the lane to install the pipeline. Most open-cut road crossings would be completed and the road resurfaced in 1 to 2 days. If an open-cut road crossing requires extensive construction time, provisions would be made for detours or other measures to permit traffic flow during construction.

Waterbody Crossings

Waterbody crossings would be constructed by Southern and FGT in accordance with applicable permits and our Procedures (Appendix E) except where we authorize modifications to the Procedures (see discussion in section 4.3.2). Our Procedures specify measures to be taken from pre-construction planning through construction, restoration, monitoring, and maintenance, and are based on best management practices (BMPs) in the pipeline industry. This includes BMPs relating to temporary bridge crossings, setbacks for extra workspaces and equipment refueling, timing, construction methods, etc. Waterbody crossing methods would typically require extra workspace on both sides of the crossing. Depending on the size and sensitivity of a waterbody, Southern and FGT would complete waterbody crossings using one of the following four typical installation techniques: open cut, dam and pump, flume, or HDD. A brief description of these techniques is provided below and the methods that would be used at specific waterbodies are tabulated and discussed as part of section 4.3.2.

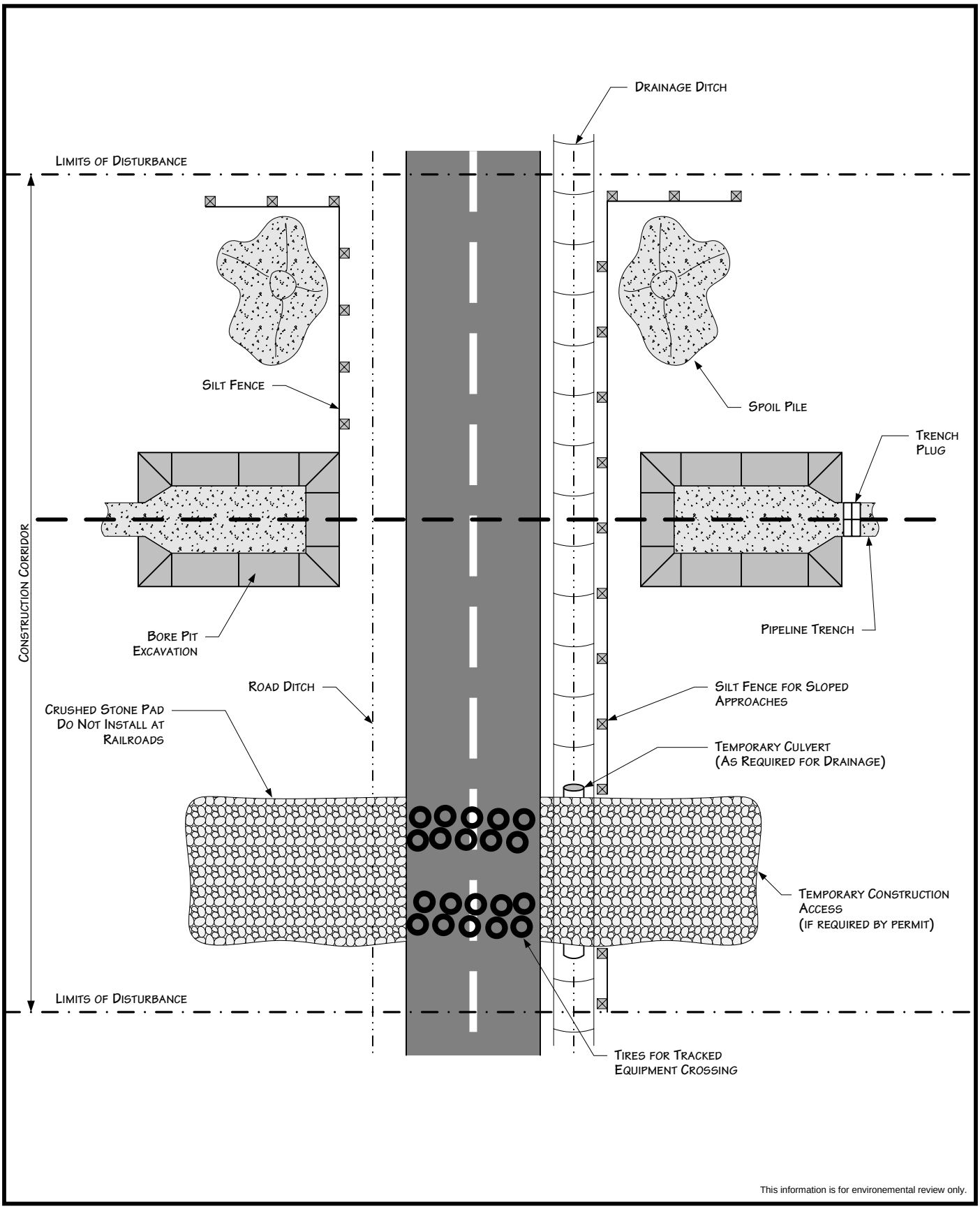


Figure 2.3.2-1
Cypress Pipeline Project
Bored Road/Railroad Crossing

Open Cut

The open cut crossing technique would be a "wet" crossing method that would be completed while the waterbody continues to flow across the work area. The open cut crossing method involves excavating a pipeline trench across the waterbody, installing a section of pipe, and then backfilling the trench with material excavated from the stream bed (see figure 2.3.2-2). Excavation and backfilling of the trench would be accomplished using backhoes or other excavation equipment operating from one or both banks of the waterbody. Trench spoil would be stored at least 10 feet from the stream banks (topographic conditions permitting). Sediment barriers, such as silt fence and staked straw bales, would be installed to prevent spoil and sediment-laden water from entering the stream.

For perennial streams that are less than 50 feet wide, and for field and roadside ditches, and intermittent streams, Southern proposes to use this method as their "Crossing Method 1." For perennial streams and ponds greater than 50 feet wide that are not designated to be crossed by HDD, Southern also proposes to use this method and would designate it as their "Crossing Method 3." The principal difference between Southern's Crossing Methods 1 and 3 is the size of the waterbody to be crossed and that in Crossing Method 3, Southern may use a drag line to excavate the trench in addition to a backhoe.

Dam and Pump

The dam and pump crossing method is a "dry" crossing method that would involve constructing temporary dams upstream and downstream of the proposed crossing and using a high capacity pump to divert water around the construction area during trenching, pipe installation, and backfilling (see figure 2.3.2-3). Dams would typically be constructed using plastic sheeting and sand or pea gravel bags. 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.

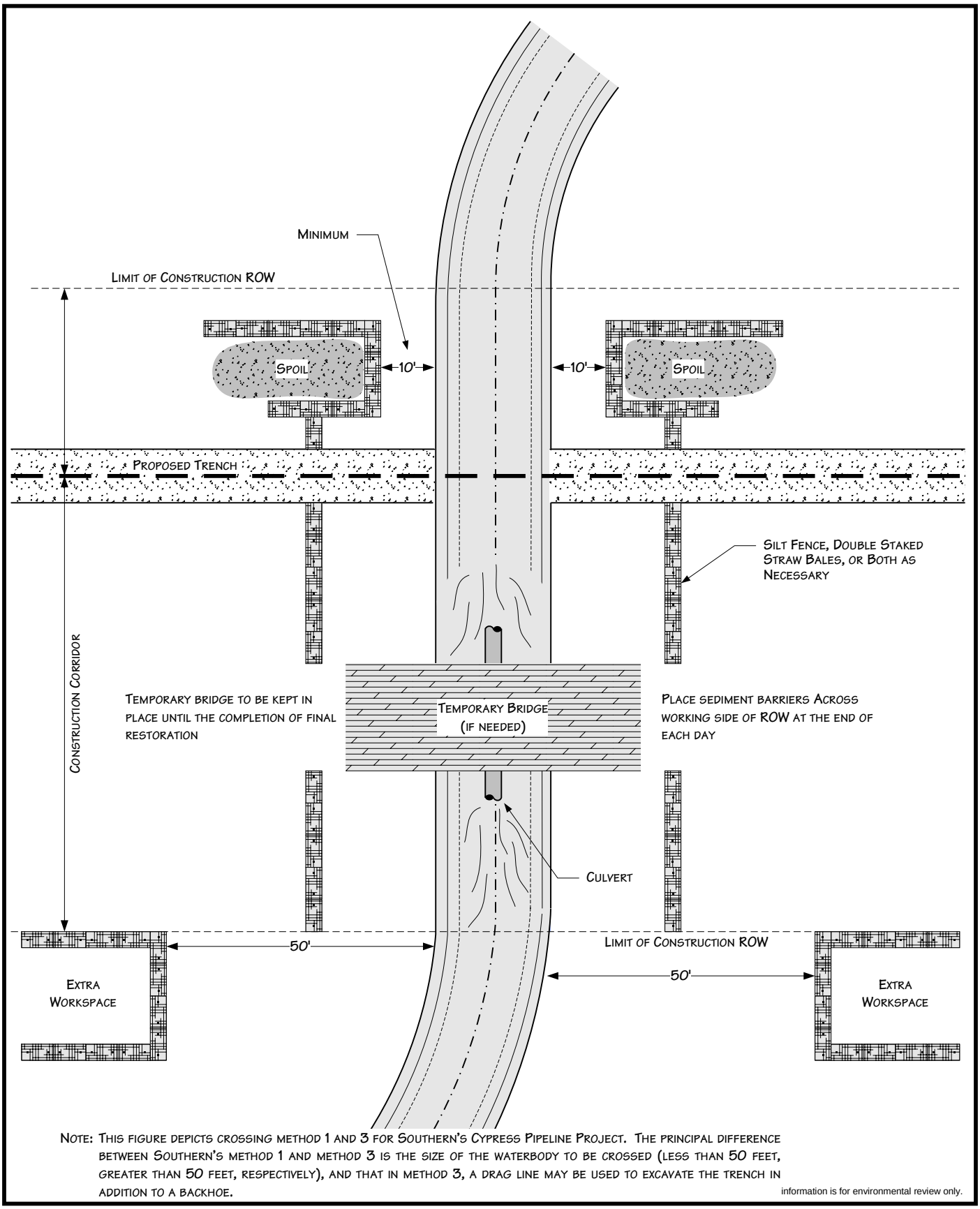
Once the area between the dams is stable, backhoes on both banks would excavate a trench across the stream. Spoil excavated from the trench would be stored in a straw bale/silt fence containment area located a minimum of 10 feet from the edge of the stream banks.

After trenching across the streambed is complete, a prefabricated segment of pipe would be installed in the trench. Following installation of the pipe, the streambed portion of the trench would be backfilled with streambed spoil and the streambanks would be stabilized.

Southern has designated the dam and pump crossing method as "Crossing Method 2," along with the Flume Crossing Method (described below), and would use these methods for perennial streams with flow between 10 and 50 feet wide with downstream water users or listed species present in the stream.

Flume Crossing Method

The flume crossing method involves diverting the flow of the stream across the construction work area through one or more flume pipes placed in the stream. 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, temporary dams would be constructed around the flume pipes upstream and downstream of the proposed trench. The dams would divert the stream flow through into flume pipes and across the work area, thereby isolating the stream flow from the construction work area (see figure 2.3.2-4).



Note: This figure depicts crossing method 1 and 3 for Southern's Cypress Pipeline Project. The principal difference between Southern's method 1 and method 3 is the size of the waterbody to be crossed (less than 50 feet, greater than 50 feet, respectively), and that in method 3, a drag line may be used to excavate the trench in addition to a backhoe.

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Figure 2.3.2-2

Cypress Pipeline and FGT Expansion Projects

Typical Open-Cut Waterbody Crossing Method

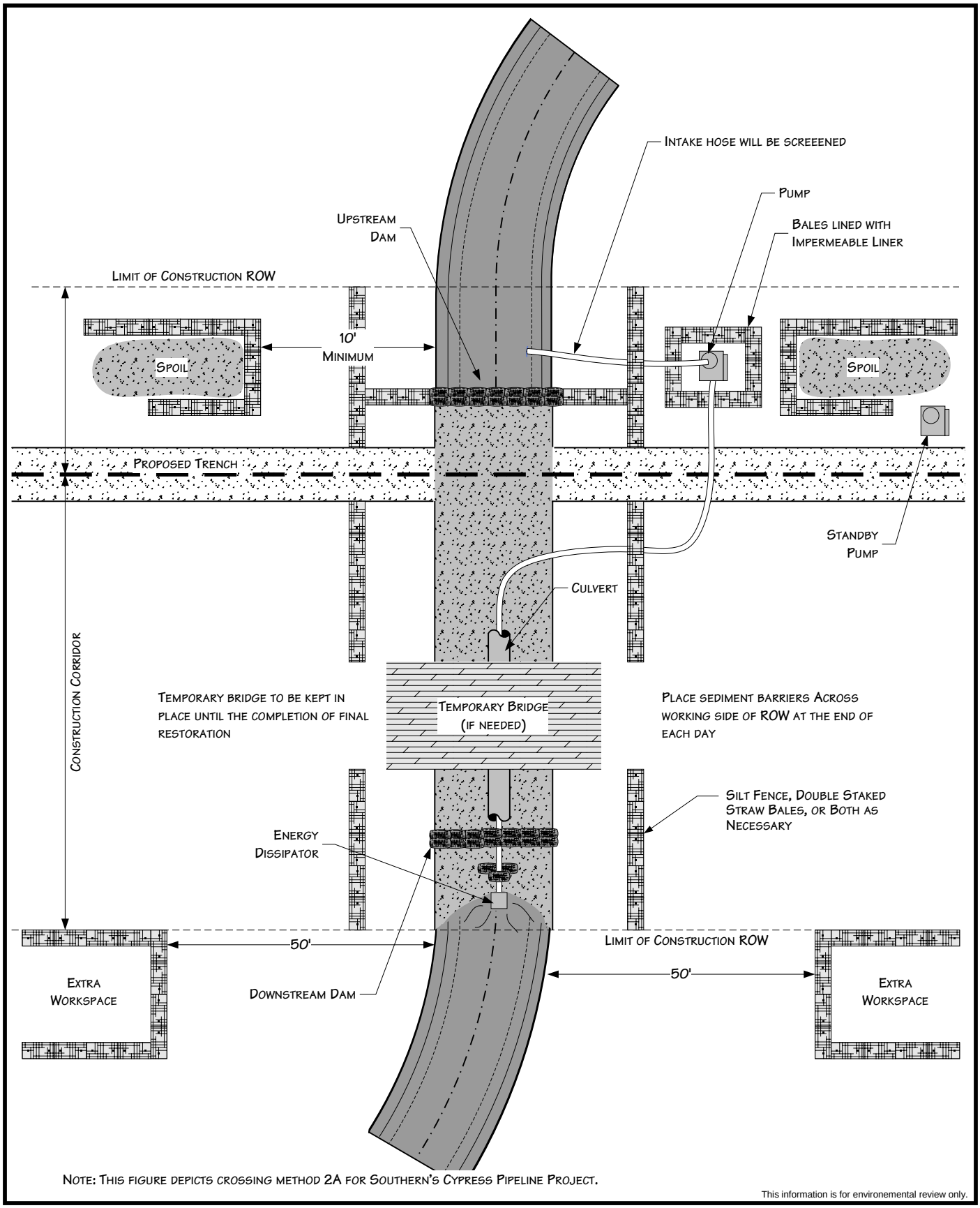


Figure 2.3.2-3

Cypress Pipeline and FGT Expansion Projects

Typical Dam and Pump Waterbody Crossing Method

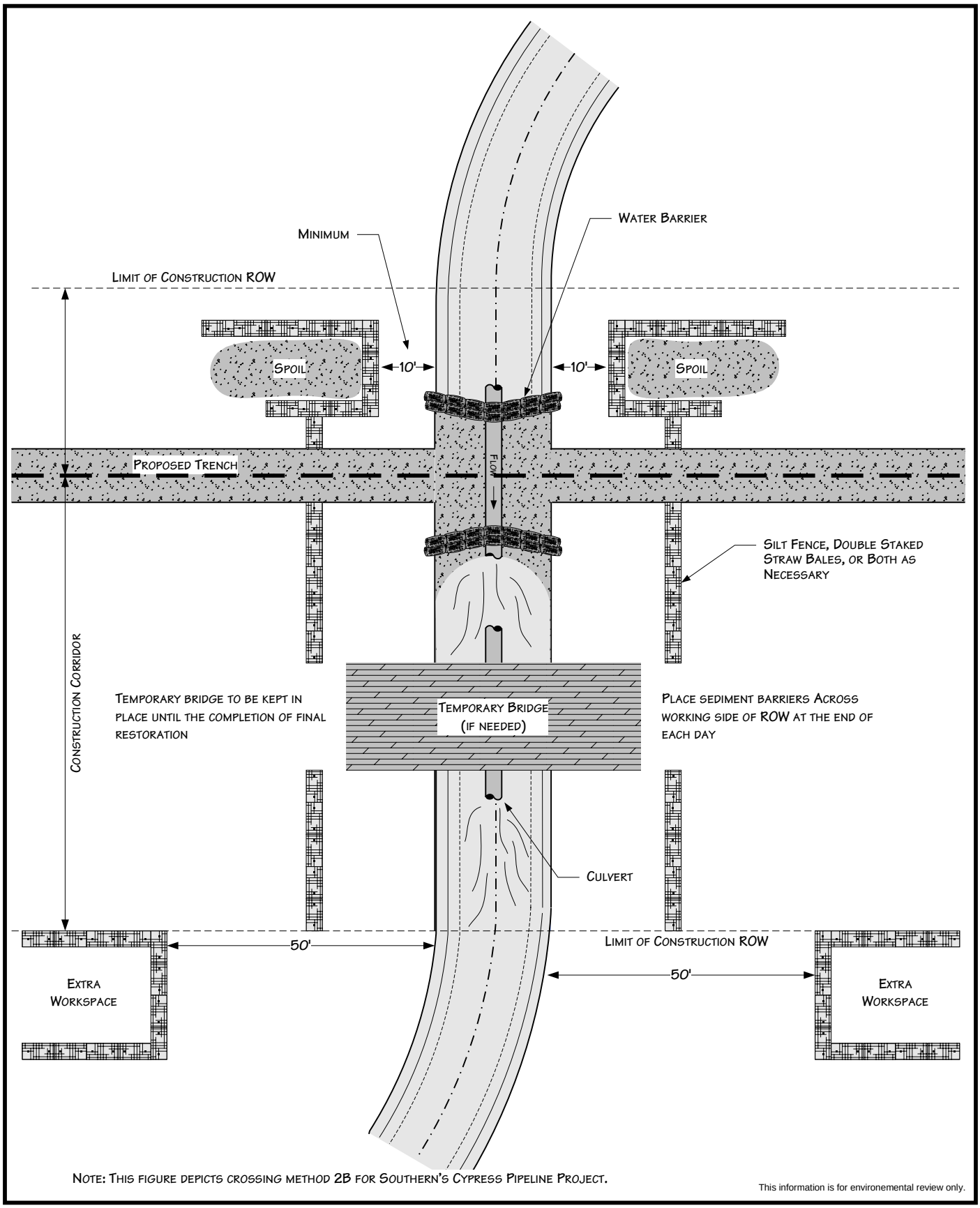


Figure 2.3.2-4
Cypress Pipeline and FGT Expansion Projects
Typical Flume Waterbody Crossing Method

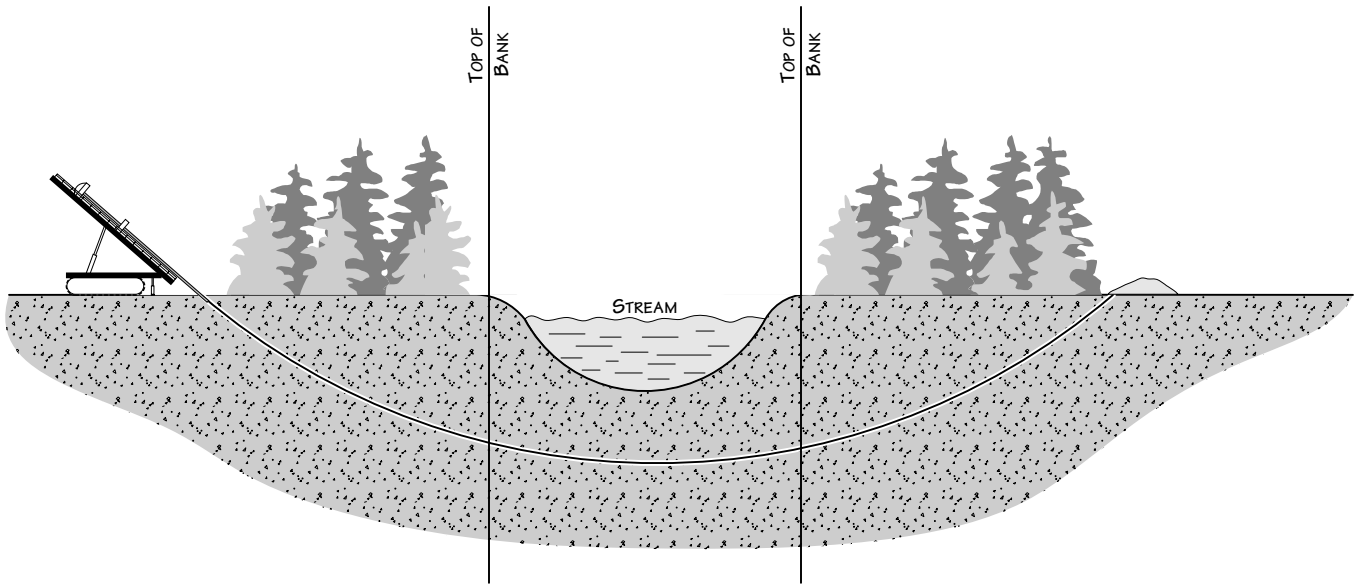
Once flow has been isolated from the work area, backhoes on both banks of the stream would excavate a trench under the flume pipe(s) in the isolated streambed. Spoil excavated from the stream trench would be placed or stored a minimum of 10 feet from the edge of the waterbody for temporary storage. Leakage from the dam around the flume pipes, 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. 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 and the stream banks would be restored. Finally, the flume pipes and dam materials would be removed from the waterbody.

Horizontal Directional Drill

The HDD method is a dry crossing method that would be used by Southern as their "Crossing Method 4." FGT has not proposed to use the HDD method at any locations. The HDD method would be used when a waterbody's size or environmental sensitivity make the use of other methods undesirable or impractical, and this method would require specialized equipment and personnel (see figure 2.3.2-5). The method has three general steps that include: 1) drilling a pilot hole on an arc-shaped path that typically extends between 30 and 50 feet beneath the waterbody; 2) enlarging the pilot hole with a series of reamers to accommodate the pipeline; and 3) pulling a prefabricated section of pipe back through the hole.

Drilling the pilot hole is the first phase of the HDD method and establishes the ultimate position of the installed pipeline. The head of the pilot drill string contains a pivoting head that can be controlled by an operator at the surface as the drill progresses. Typically, the pilot hole would be directed downward at an angle until the proper depth is achieved, then turned and directed horizontally for the required distance, and finally angled upward back to the surface. Tracking and steering of the drill head would be guided using two insulated wires (about 0.25 inch) laid on the ground surface. A probe located behind the drill bit would detect an electric current in the wires and utilize triangulation to locate the head of the drill bit to make steering adjustments. Throughout the process of drilling and enlarging the hole, a mud slurry consisting of bentonite and water would be pressurized and pumped through the drill stem to lubricate the drill bit, maintain the hole, and remove drill cuttings. Bentonite is the commercial name for 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. This slurry, referred to as drilling mud or drilling fluid, has the potential to be inadvertently released to the surface if fractures or fissures are encountered in the substrate during drilling.

The potential for an inadvertent release of drilling mud (also referred to as a frac-out) is generally greatest during drilling of the pilot hole when the pressurized drilling mud is seeking the path of least resistance. The path of least resistance is typically back along the path of the drilled pilot hole. However, if the drill path becomes temporarily blocked or encounters other areas such as large fractures or fissures that lead to the ground, or a wetland or waterbody, then an inadvertent release could occur. Southern would monitor the pipeline route and the circulation of drilling mud throughout drilling for indications of an inadvertent release and would immediately implement corrective actions if a release is observed or suspected to be occurring. The corrective actions Southern would implement are outlined in its HDD Plan (see Appendix F-2).



This information is for environmental review only.

Figure 2.3.2-5
Cypress Pipeline Project
Typical HDD Waterbody Crossing Method

Once the pilot hole exits in an acceptable location, the reaming operation is initiated. During the reaming phase, a reaming head would be attached to the drill pipe and pulled back through the pilot hole to enlarge it. Several reaming passes would be made with incrementally larger reaming heads to enlarge the hole to about 1.5 times the diameter of the pipeline. As the drill path becomes larger, the potential for an inadvertent release generally would decrease as the path of least resistance becomes increasingly well established along the drill hole. Pressurized drilling fluid would continue to be jetted through the reaming head to float out drill cuttings and debris, to cool the drilling head, and to provide a cake wall to stabilize the hole. Once the drill hole is enlarged to the proper diameter, the pipe would be pulled back through the reamed hole.

Each HDD crossing would require extra workspaces for drilling equipment, pipe assembly, supplies and materials, temporary mud pits and tanks, support vehicles, and access to the drilling sites and areas to turn equipment around. Access to the stream bank would also be needed for placement of temporary surface wires to electronically track the HDD pilot drill across the waterbody. Access to the bank on either side of the stream may also be necessary to withdraw water as needed for mixing the drilling mud or hydrostatic pressure testing of the pipe section. Erosion control measures would be installed in accordance with our Plan and Procedures (Appendices D and E, respectively) and stormwater permits to prevent sediment-laden water from leaving the temporary work areas would be obtained. After the HDD is completed, drilling mud would be disposed of at an approved facility.

Due to limitations in the bending radius of steel pipe and the specialized requirements for implementing this method, the HDD method is generally not feasible for smaller waterbodies. It can also be impractical in other locations under certain geotechnical conditions that may affect drilling mud circulation or drill hole or pipeline integrity when the pipe is pulled back into the hole. Some examples of difficult geotechnical conditions include areas with fractured bedrock, subsurface boulders, or unconsolidated materials such as loose sands and gravel. Southern has conducted a feasibility assessment for its proposed HDD crossing locations which is provided in Appendix F-2. In its comments on the draft EIS, Southern supplemented its existing HDD crossing feasibility analysis. Based on the results of the most recent geotechnical data collected, Southern indicated that the subsurface conditions along the proposed HDD crossings are highly favorable for the HDD installation method. A copy of this most recent HDD assessment has been included in Appendix F-2. Based on the feasibility analysis, and as discussed further in section 4.3.2, site-specific HDD construction plans have been developed by Southern where the HDD crossing method is considered feasible.

Wetland Crossings

Southern and FGT would cross delineated wetlands in accordance with federal and state permits and following the measures in our Procedures, except where modifications are requested and approved by the FERC and other jurisdictional agencies (i.e., COE and FLDEP) (see section 4.4). Wetland resources are discussed further in section 4.4.

Pipeline construction across wetlands would be similar to typical conventional upland cross-country construction procedures, with several modifications and limitations to reduce the potential for pipeline construction to affect wetland hydrology and soil structure.

Standard wetland construction mitigation measures would require that equipment working in wetlands be limited to that essential for clearing the right-of-way, 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 wetlands, non-essential equipment would be allowed to travel through wetlands only if the ground is firm enough or has been stabilized to avoid rutting. Otherwise, non-essential equipment would be allowed to travel through wetlands only once. If the

wetland can not support equipment without rutting, equipment operating in the wetland would need to be stabilized with prefabricated equipment mats or terra mats. Southern has also proposed to use gravel over geotextile fabric as a means to temporarily stabilize the working surface in wetlands, and this construction technique is analyzed further in section 4.4.

Clearing of vegetation in wetlands would be limited to trees and shrubs, which would be cut flush with the surface of the ground and removed from the wetland. To avoid excessive disruption of wetland soils and the native seed and rootstock within the wetland soils, stump removal, grading, topsoil segregation, and excavation would be limited to the area immediately over the trench line. A limited amount of stump removal and grading may be conducted in other areas if dictated by safety-related concerns. Topsoil segregation over the trench line would occur if the wetland soils were not saturated at the time of construction.

During clearing, sediment barriers, such as silt fence and staked straw bales, would be installed and maintained adjacent to wetlands and within temporary extra workspaces as necessary to minimize the potential for sediment runoff. Sediment barriers would be installed across the full width of the construction right-of-way at the base of slopes adjacent to wetland boundaries. Silt fence or straw bales installed 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. Sediment barriers would also be installed within wetlands along the edge of the right-of-way, where necessary, to minimize the potential for sediment to run off the construction right-of-way and into wetland areas outside the work area. If trench dewatering is necessary in wetlands, silt-laden trench water would be discharged in accordance with our Procedures (see Appendix E), in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any waterbody. The 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. As discussed in section 4.3.2, the dewatering structures would be sized to handle the volume of water in the trench.

The method of pipeline construction used in wetlands would depend largely on the stability of the soils at the time of construction. Where wetland soils are saturated and/or inundated, a “push-pull” technique may be used for trenching and installation. The push-pull technique would involve stringing and welding the pipeline outside of the wetland and excavating the trench through the wetland using a backhoe supported by equipment mats. The water that seeps into the trench would be used to float the pipeline into place using floatation devices that are attached, and by pushing or pulling the pipe with equipment and winches. After the pipeline is floated into place, the floats would be removed and the pipeline would sink into place. Most pipe installed in saturated wetlands would be coated with concrete or equipped with set-on weights to provide negative buoyancy. After the pipeline sinks into place, backhoes working on equipment mats would backfill the trench and complete cleanup.

Because little or no grading would occur in wetlands, restoration of contours would be accomplished during backfilling. Prior to backfilling, trench breakers (polyurethane foam or bags of sand) would be installed where necessary to prevent the subsurface drainage of water from wetlands. Where topsoil has been segregated from subsoil, the subsoil would be backfilled first followed by the topsoil. Topsoil would be replaced to the original ground level leaving no crown over the trench line. In some areas where wetlands overlie rocky soils, the pipe would be padded with rock-free soil or sand before backfilling with native bedrock and soil. Equipment mats and/or terra mats would be removed from wetlands following backfilling. After backfilling and major grading work are complete, any drivable berms would be removed and the ground surface returned to original contours. If a sediment control device is still needed at a location where a drivable berm was removed, a temporary sediment control device such as silt fencing would be installed.

Where wetlands are located at the base of slopes, permanent slope breakers would be constructed across the right-of-way in upland areas 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.

Temporary extra workspaces may be required on both sides of wetlands to stage construction, fabricate the pipeline, and store materials. Temporary extra workspaces for wetland crossings would be located in upland areas a minimum of 50 feet from the wetland edge unless site-specific approval for a reduced setback is granted by the FERC and other jurisdictional agencies.

Cypress Pipeline Project

Southern has defined four wetland crossing methods that it would implement at various wetlands crossed by the project. These four methods are described below.

Method 1 – In wetlands where soils are dry at the time of construction and can support construction equipment without sinking (e.g., mineral hydric soils), construction would occur in a manner similar to conventional upland construction techniques. A reduced right-of-way width would be used, and the top 12 inches of topsoil from the trenchline would be stripped and stored separately from subsoil. Figures 2.2.1-2 and 2.2.1-4 depict Southern's typical wetland crossing utilizing method 1.

Method 2 – In wetlands where soils are too wet to support equipment (e.g., permanently or semi-permanently saturated), construction would occur in a manner similar to conventional upland techniques; however, a reduced right-of-way width and timber mats would be used to minimize impacts (see figure 2.3.2-6). Topsoil segregation generally would not be possible in saturated soils.

Method 3 – In wetlands where standing water is present (permanently or semi-permanently flooded), the push-pull method would be implemented. There would be no passing or working lanes. Figure 2.3.2-7 shows a typical push-pull wetland crossing.

Method 4 –The HDD method would be used in specialized circumstances for crossing certain wetland areas, typically associated with other sensitive features such as waterbodies. The drill rig would be staged in a large extra workspace generally set back 50 feet from the edge of the wetland in accordance with our Procedures (see Appendix E). However, at certain wetlands Southern has requested modifications from our Procedures to allow the workspace to be located either immediately adjacent to, or within wetlands (see section 4.4.5). When workspace is located within wetlands, equipment would be supported where soft ground is encountered. Pipe sections long enough to span the entire crossing would be staged and welded along the construction work area on the opposite side of the drill entry point and then pulled through the drilled hole. In marshy locations, it may be possible to fabricate the pull section from a push site located on dry ground and advance it towards the exit point either on pipe rollers or in a flotation ditch. Figure 2.3.2-5 shows a conceptual HDD crossing.

In accordance with our Procedures, Southern would use a 75-foot-wide construction right-of-way in a portion of the wetlands crossed by the project; however, Southern is requesting modifications to increase the right-of-way width in a majority (about 71 percent) of the wetlands crossed based on analyses of the soils along the route. Southern's analyses indicates that many of the wetland soils that are crossed lack sufficient structure/strength to support construction equipment and would be prone to trench wall sloughing or caving, which would result in a greater trench width and therefore require a greater construction right-of-way (see sections 4.2 and 4.4). In theses areas, Southern proposes to use a 90-foot-wide right-of-way for the loop and an 82-foot-wide construction right-of-way for the mainline (see figures 2.2.1-2 and 2.2.1-5, respectively).

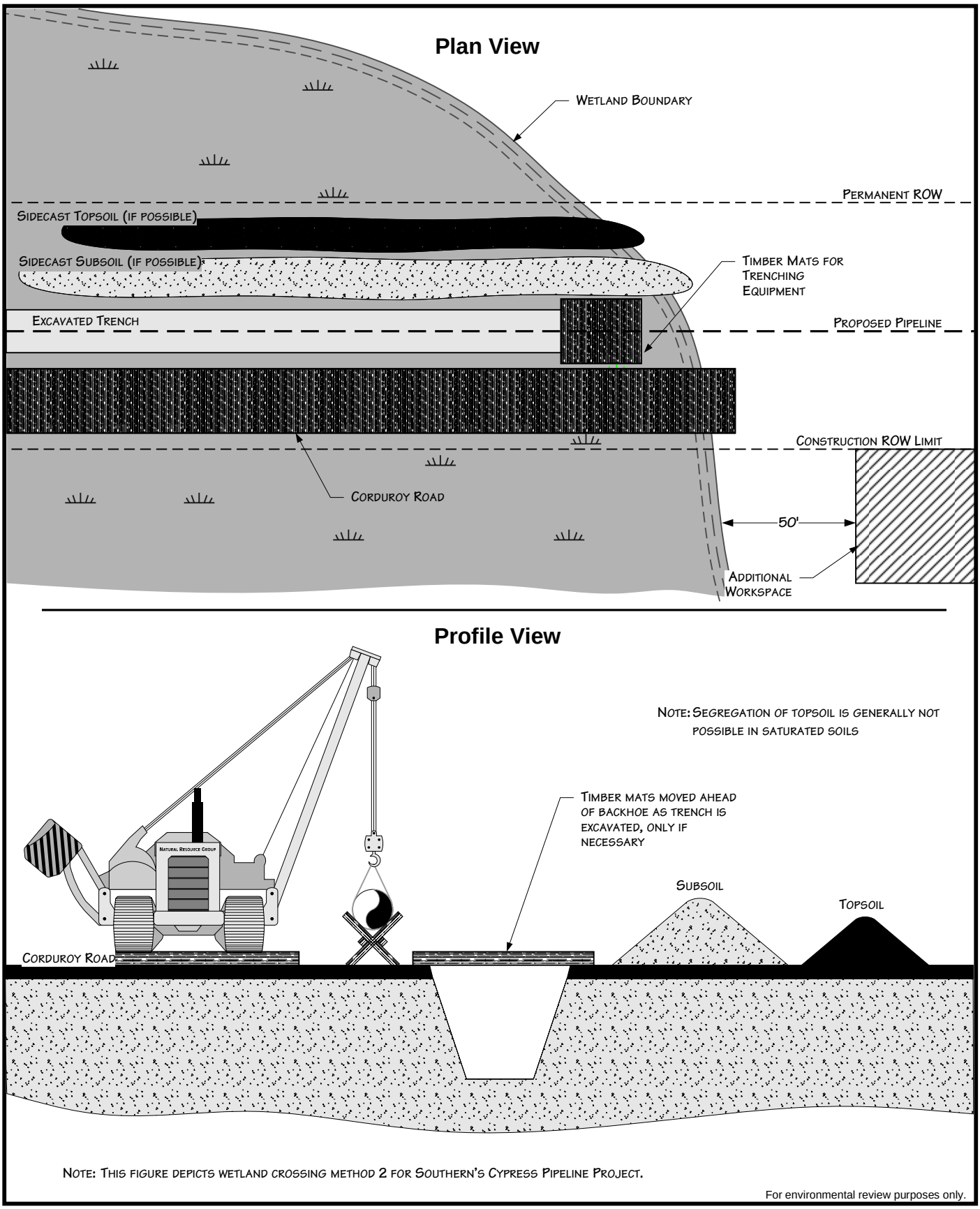
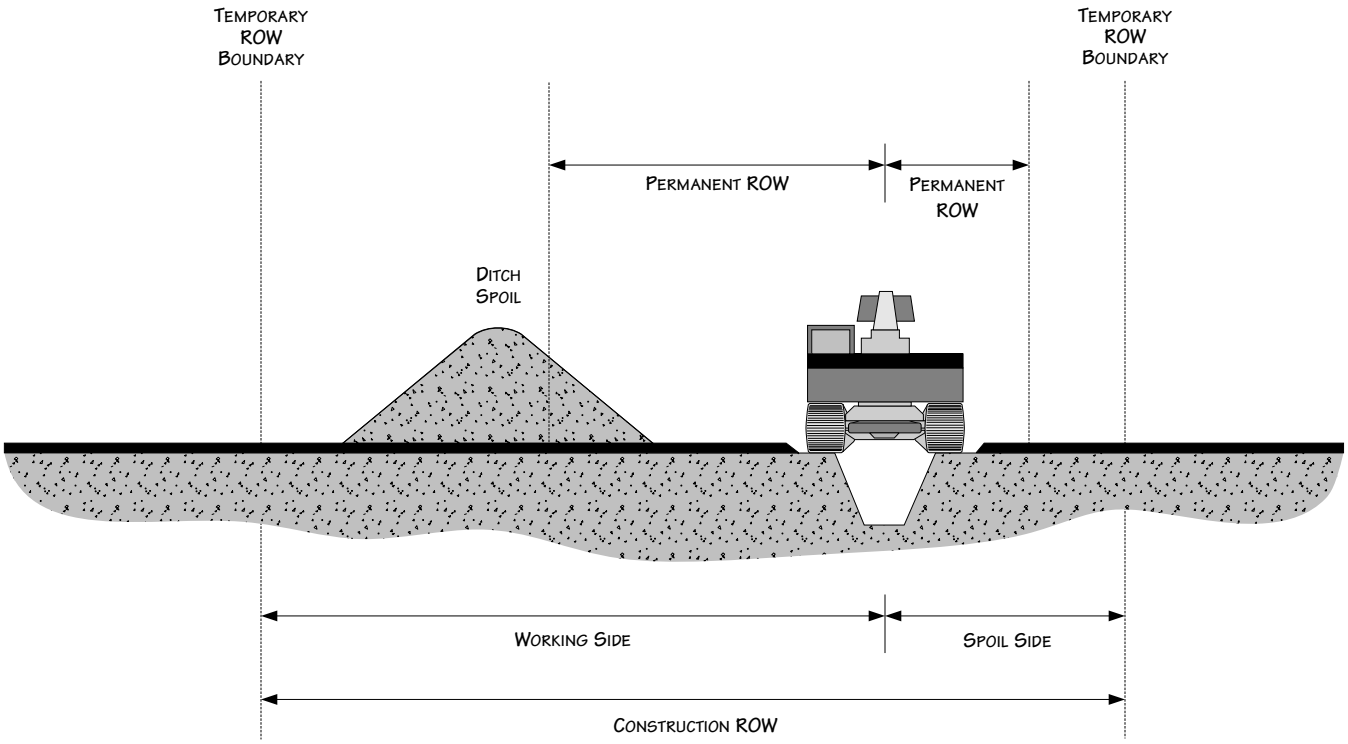


Figure 2.3.2-6

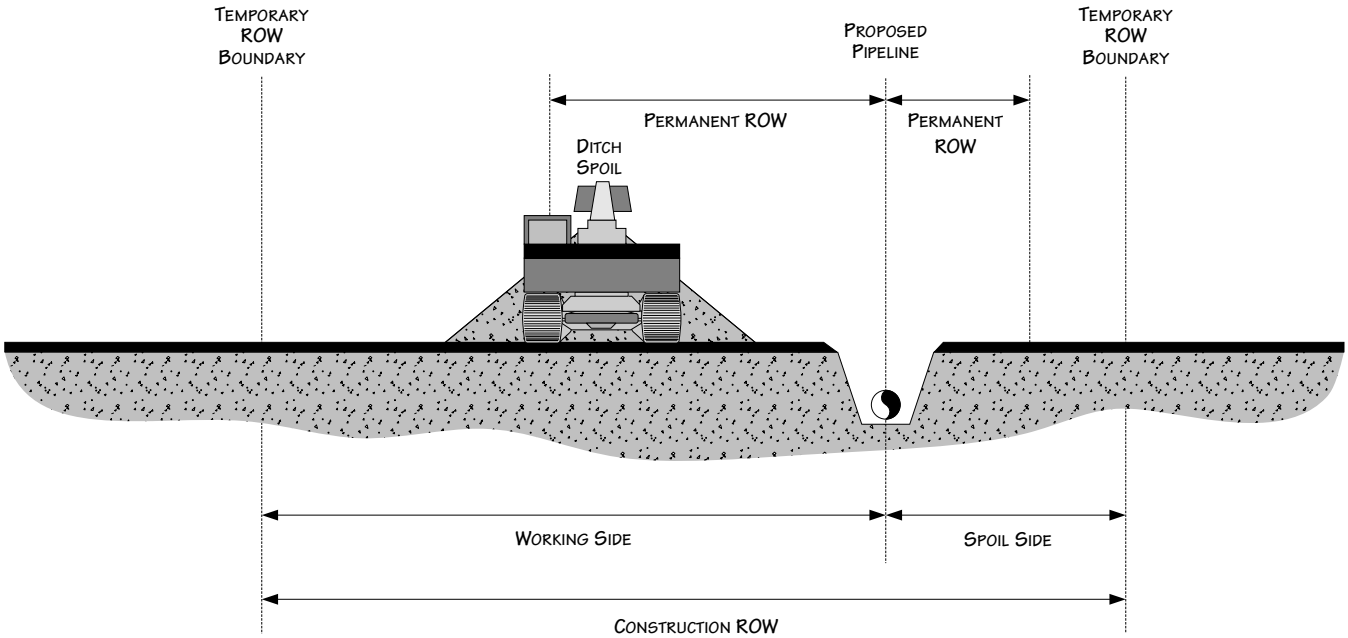
Cypress Pipeline and FGT Expansion Projects

Typical Wetland Crossing Method with Construction Mats

Trenching Schematic



Backfill Schematic



Note: This figure depicts wetland crossing method 3 for Southern's Cypress Pipeline Project.

Figure 2.3.2-7

Cypress Pipeline and FGT Expansion Projects

Typical Submerged Wetland Push/Pull Method

Trenching and Backfill Schematics

FGT Expansion Project

FGT would utilize wetland crossing methods similar to Southern's methods 1 and 2 as described above. Depending on conditions at the time of crossing, FGT may use the push-pull method. FGT does not anticipate the use of the HDD method.

FGT would use a 75-foot-wide construction right-of-way in wetlands crossed by the project in accordance with our Procedures (see Appendix E). Because the working side of the construction right-of-way would generally be located mostly within FGT's existing permanent easement, a majority of the construction-related disturbance would occur to wetland areas that have been previously disturbed by past pipeline installation activities and are maintained in an emergent state.

Residential Areas

Construction within residential areas or in close proximity to homes may require special construction techniques to accommodate limited workspace and to minimize disturbance to residents and structures. Southern's construction work areas would be within 50 feet of two residences during loop construction and six residences during mainline construction. The FGT Expansion Project construction work areas would occur within 50 feet of 34 residences, including 4 on Loop J, 1 on Loop K, and 29 on Loop G. The locations for these residences are detailed in section 4.8.3.

In order to minimize impacts to residential areas, both Southern and FGT would limit or modify their typical construction methods. Southern has developed site-specific construction plans for each residence within 50 feet of construction work areas, plus two additional residences that are slightly greater than 50 feet from construction work areas. These plans consist of drawings that depict the locations of the structures and other features such as roads and fences, and depict the modifications that would occur to the typical pipeline alignment, right-of-way widths, and extra workspaces to avoid or minimize impacts to the residences. FGT has indicated it would provide similar drawings for residences where it would be unable to maintain 25 feet or more or separation which are discussed in section 4.8.3. In addition, for residences within 50 feet of work areas, both Southern and FGT would:

- reduce the construction right-of-way width;
- install safety fence along the edge of the construction work area adjacent to the residence for a distance of 100 feet on either side of the residence;
- preserve as many trees as possible on residential property;
- trim tree branches on the working side to allow for safe operation and passage of construction equipment. Vegetation removed would be disposed of as negotiated by the landowner and the companies;
- restore or replace lawns and landscaping to pre-construction conditions;
- repair as necessary walls and other structures within the construction work area as negotiated with the landowner. This work will be completed in a reasonable time after the trench is backfilled and cleanup is complete;
- segregate topsoil where appropriate or as negotiated with the landowner;
- maintain utility service during construction activities;

- construct only during daylight hours;
- clean up and backfill the area immediately after the pipeline is installed; and
- revegetate at the first seasonal opportunity.

2.3.3 Aboveground Facility Construction Procedures

The crews installing the aboveground facilities would generally work separately from the pipeline construction crews. This is true for the phased installation of compressor stations proposed by Southern which would occur after installation of the mainline (see construction schedule discussion in section 2.4), and also applies to the compressor station upgrades and other facility modifications that FGT would complete that are distant from the FGT loops. For other aboveground facilities such as valves and pig launchers and receivers, the crews may not begin work until immediately after the associated pipeline facility is installed, and construction could occur within areas disturbed by the pipeline.

The first step in construction of aboveground facilities would be to clear the sites of vegetation, grade the terrain as necessary to accommodate movement of construction vehicles, and prepare the area for building and other structure foundations. After clearing is completed, silt fence and/or straw bales would be installed where necessary to minimize soil runoff and sedimentation.

For new compressor facilities, building construction would commence after level foundations are prepared. Typically, the building frame would be erected, followed by the installation of the roof, exterior finish, insulation, and interior finish. After that, the air inlet and exhaust facilities would be added. Construction of structures located outside of buildings, such as coolers, condensers, oil heaters, and glycol reboilers, would begin after concrete footings and/or foundations are prepared. The piping work may occur either in a fabrication shop offsite, or onsite, subject to size and weight considerations. Piping installed below grade would be coated for corrosion protection prior to backfilling, and a cathodic protection system would typically be installed to protect underground piping.

Before the facilities are placed in service, the gas piping system (both above and below ground) would be pressure tested. Hydrostatic pressure testing procedures are described in section 4.3.2. Controls and safety devices such as the emergency shutdown system, relief valves, gas and fire detection facilities, overspeed, vibration, as well as other on- and off-engine protection and safety devices would be tested during the commissioning phase of construction.

After the completion of start-up and testing, the disturbed areas would be final graded. Cleanup and restoration of various parts of the site would be completed as work on the area is finished. A security fence would be extended around the perimeter of the new facilities. Roads and parking areas would be graveled.

Many of the procedures used in meter station construction would be similar to those described above for compressor stations and would include clearing and grading, preparing foundations, installing electric 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, graveling the site, and fencing the facilities.

Valve and pig launcher and receiver construction would be similar to construction of meter stations, but without buildings, foundations, and associated facilities. These sites also would be graveled and fenced.

2.4 CONSTRUCTION SCHEDULE

Southern has proposed to construct its pipeline facilities in three phases. Phase I is planned to begin by October, 2006 and could be earlier subject to weather and regulatory approvals. Phase I is planned to be in service by May, 2007. Southern plans to begin construction of Phase II in the fall of 2008 in order to have the facilities in service by May, 2009. Construction of the Phase III facilities is planned to begin in the fall of 2009 to be in service by May, 2010.

Southern's Phase I facilities would include the mainline to be installed between Southern's existing pipeline system in Effingham County, Georgia and the proposed interconnect with the FGT system in Clay County, Florida. Phase I would include interconnects with AGL in Glynn County, Georgia; South Georgia in Nassau County, Florida; and JEA Brandy Branch Power Plant in Duval County, Florida, plus modifications to Southern's existing Marietta Meter Station in Cobb County, Georgia.

In Phase II, Southern would construct the proposed new compressor station in Glynn County, Georgia. In Phase III, Southern would construct the two additional compressor stations in Liberty County, Georgia and Nassau County, Florida. Phase III would also include the construction of Southern's loop between its Port Wentworth Meter Station in Chatham County, Georgia and its Rincon Gate Meter Station in Effingham County, Georgia.

FGT's project is planned to be completed in two phases, with Phase I construction starting in October, 2006 to be in service by May, 2007. Phase II is planned to begin in the October, 2008 to be in service by May, 2009. Phase I would include all of Loop J, 6 miles on Loop K, and 6.3 miles on Loop G. Phase I would also include all the aboveground facilities except for Compressor Station 27 and two of the remote blowdown valves. The Compressor Station 27 facilities would be constructed beginning in December, 2007 and be in-service by May, 2009. Phase II would include the balance of pipeline on Loops K and G and their associated blowdown valves.

2.5 ENVIRONMENTAL COMPLIANCE INSPECTION AND MITIGATION MONITORING

To ensure environmental compliance of the projects, Southern and FGT would include project-specific environmental requirements into construction drawings and specifications that are used to solicit bids or included in contract documents. These requirements would include our Plan and Procedures (see Appendices D and E, respectively), with approved modifications, the FERC certificate conditions, applicable permits, and additional requirements of federal, state, and local agencies. Contractors would be provided copies of drawings and specifications approved for construction and the permits, certificates, and clearances associated with the project.

Prior to construction, Southern and FGT would provide environmental training for project personnel and inspectors to familiarize them with the specific environmental conditions and issues associated with the project. Contractor personnel would also be provided training to ensure familiarity with the environmental requirements of each project. If, at any time during construction, the contractor is in violation of an environmental requirement, Southern and FGT would require an immediate correction of the problem, issue a stop work order if necessary, and resolve the issue with the contractor (including disciplinary action if appropriate).

Southern indicated that it would supply only one Environmental Inspector (EI) for each spread unless an agency requires more inspectors. Our Plan requires at least one EI for each construction spread and specifies that the actual number and experience of the EIs assigned to a project should be appropriate for the length and the significance of the resources affected. Due to the extended length of each mainline

construction spread and the significant number of wetland and waterbody resources that would be crossed, additional EIs may be necessary on each mainline spread to adequately inspect the construction and restoration activities for the Cypress Pipeline Project. If the Cypress Pipeline Project is authorized by the Commission, Southern would be required to submit an Implementation Plan for our approval prior to the commencement of construction. Typically, we require that an Implementation Plan identify the number of EIs assigned per spread and describe how the company would ensure that sufficient personnel are available to implement the environmental mitigation. When we review the Implementation Plan, we would consider the number and qualifications of the EIs identified by Southern and determine whether they are appropriate for this project.

Southern would also employ qualified biological monitors to be on-site in specific locations identified as threatened and endangered species habitat throughout construction and restoration of the pipeline. These monitors would survey the construction area each day prior to the start of construction for the presence of protected species, including any open trenches and equipment areas.

By adopting the FERC Plan, FGT also proposes to have at least one EI for each construction spread and would be obligated to ensure the actual number and experience of the EIs would be appropriate for the length and the significance of the resources affected. Due to the short length of each loop construction spread but the extended distance from each other during Phase I construction, additional EIs may be necessary to adequately inspect the construction and restoration activities for the FGT Expansion Project. Similar to Southern, FGT would be required to submit an Implementation Plan that identifies the number of EIs assigned per spread and describes how they would ensure that sufficient personnel are available to implement the environmental mitigation. When we review FGT's Implementation Plan, we would consider the number and qualifications of the EIs identified by FGT and determine whether they are appropriate for this project.

In addition to the personnel requirements specified above, we believe that a third-party independent Environmental Compliance Monitoring and Reporting Program (ECMR Program) for the Cypress Pipeline Project would provide a number of benefits, both to us and to Southern. Southern has agreed to support the ECMR Program. 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 FERC staff in screening and processing variance requests during construction.

The ECMR Program would involve the use of full-time third-party compliance monitors representing the Commission at each construction spread to monitor compliance with project mitigation measures and requirements throughout construction. These monitors would provide continuous feedback on compliance issues to us, as well as to Southern's personnel. These monitors also would track and document progress of construction by the preparation and submittal of reports to our staff on a regular and timely basis.

Surface disturbance locations and acreages identified in this EIS are anticipated to be sufficient for the construction and operation (including maintenance) of the project and all ancillary improvements. However, route realignments and other project refinements often continue past the project review phase and into the construction phase. As a result, work area locations and disturbed acreages documented in the EIS may change after project approval. These changes frequently involve minor route realignments or moving approved extra workspace, adding new temporary workspace, and adding access routes to work areas and associated temporary workspace areas.

Subsequent to project approval, when work areas outside those evaluated in this EIS are found to be needed, additional inventory and evaluation would be performed to ensure that impact on biological,

cultural, and other resources would be avoided or minimized to the maximum extent practicable. New workspace location and survey results would be documented and forwarded to the FERC in the form of a "variance request." Appropriate agency consultations/approvals would be conducted/obtained prior to approval of the variance. At the conclusion of the project, as-built drawings would be provided to us.

While implementing the Commission's Pre-Filing Process, Southern and FGT distributed toll-free telephone numbers and website addresses to affected landowners and other stakeholders. We encourage Southern and FGT to continue their commitment to communicate with affected landowners and other parties. During construction it is imperative that landowners have an avenue to contact Southern and FGT regarding construction issues and complaints. The Commission staff is interested in ensuring that landowner issues are resolved in a timely and efficient manner, should the project be approved. Residential impacts are evaluated further in section 4.8.3.

2.6 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

Both Southern's and FGT's facilities would be designed, constructed, and operated in accordance with requirements of our Plan and Procedures (see Appendices D and E, respectively), and the Office of Pipeline Safety (OPS) and the DOT, with approved modifications and industry-proven practices and techniques. This would ensure integrity of the pipeline, minimize potential for pipe failure, and provide customers and the general public with a safe and dependable natural gas supply.

In accordance with Title 49 CFR Part 192, each new pipeline facility would be inspected for leakage as part of scheduled operations and maintenance procedures.

After construction is completed, the pipeline facilities would be clearly marked at line-of-sight intervals and at crossings of roads, railroads, and other key points. Markers would include a telephone number and address where a company representative could be reached in case of an emergency or prior to any excavation in the area.

Southern proposes to perform vegetation clearing every two years due to the long, wet growing season of the coastal Georgia and Florida area. Annual vegetation maintenance would occur in DOT Class 3 population centers when requested by a landowner. This vegetative maintenance by Southern would be more frequent than what is recommended in our Plan and Procedures (see Appendices D and E, respectively), and would require our approval (discussed in section 4.5). FGT would follow the FERC's recommended vegetation measures.

Southern would conduct periodic aerial and ground inspections to identify erosion, leaks in the line, condition of the vegetative cover, unauthorized encroachment of the right-of-way, or other conditions that may warrant a safety hazard. The cathodic protection system would be monitored and inspected periodically to ensure proper and adequate corrosion protection. FGT would also be required to implement these inspection measures.

Compressor station crews would perform operation and maintenance of new equipment. Safety equipment, such as pressure relief devices, fire detection and suppression systems, and gas detection systems would be maintained throughout the life of each facility. Southern and FGT would maintain contact with the public as well as with government agencies having jurisdiction over areas traversed by the pipelines and the immediate area of each compressor station.

2.7 FUTURE PLANS AND ABANDONMENT

Southern currently has no plans for future expansion of the facilities beyond that which has been proposed. Southern would construct the proposed facilities in multiple phases to address anticipated future demands for additional natural gas service. The proposed Cypress Pipeline Project has a design life of more than 50 years; the actual life may be considerably longer. However, in the event of project termination/abandonment, Southern would propose to remove aboveground structures, while abandoning subsurface structures in place.

While Southern, an El Paso Company, has no reasonably foreseeable plans for future expansion of the Cypress Pipeline from Elba Island to Jacksonville beyond the facilities proposed, a separate project from Elba Island north to Hart County, Georgia and Anderson County, South Carolina by El Paso Corporation, known as the "Elba Express Project," is currently under consideration. Elba Express is a separate company created to develop the pipeline and not part of the Cypress Pipeline Project or Southern's existing pipeline system. The routing for Elba Express Project, however, may use the existing pipeline corridor between Port Wentworth and Rincon, Georgia. Any impacts associated with routing the Elba Express Project pipeline would be addressed in the environmental review now underway in Docket No. PF06-14-000 and in any subsequent Certificate proceeding following completion of the Pre-Filing Process.

Similarly, FGT has no foreseeable plans for future expansion or abandonment of facilities beyond that which is proposed. At the end of the useful life of the pipeline, FGT would obtain the necessary approvals to abandon its facilities.

Should Southern or FGT expand or abandon the proposed facilities in the future, the companies would be required to obtain a FERC authorization or Certificate and the associated environmental and non-environmental analyses. In addition, any future expansion or abandonment would be subject to appropriate federal, state, and local regulations in effect at that time.