

## Appendix B – Pipeline Expansion Projects Included in the *RGDS*

In reviewing the list of pipeline expansion projects included in the *RGDS*, LAI has identified pipeline projects that have pre-filed or filed Natural Gas Act Section 7C certificate applications at FERC prior to April 22, 2014. To the extent the applicant included proof of market support in the form of executed precedent agreements to provide the pipeline with the credit and revenue assurance to commit capital, LAI has made the simplifying assumption that the precedent agreements constitute proof of market support for the pipeline to proceed with construction upon FERC approval. No independent analysis of either the certificate application or the precedent agreement(s) has been conducted.

The projects enumerated in Appendix B are described by location. Project costs are disaggregated by component where such detail is included in a project's certificate application. Pipeline expansion projects are listed alphabetically rather than sorted by PPA. Therefore readers may find it useful to scroll to the map of project facilities in order to identify the general location by state or province. The pipeline expansion projects identified in this Appendix have been incorporated in the Target 2 build out represented in GPCM and will therefore serve as the starting point in the Target 4 analysis oriented around the frequency and magnitude of locational constraints across the Study Region. Also in Target 4, the capital costs of these future expansion projects, along with recently completed expansion projects, will be used as the basis for estimating the costs of incremental firm transportation capacity by location.

A discussion of the highlights of the proposed pipeline expansion projects incorporated in the expanded *RGDS* pipeline topology across six PPAs follows. Additional expansion projects which are under development but did not meet the criteria for inclusion in the *RGDS* as of April 22, 2014 have been included in Sensitivity #13 and are summarized in Appendix C.<sup>1</sup>

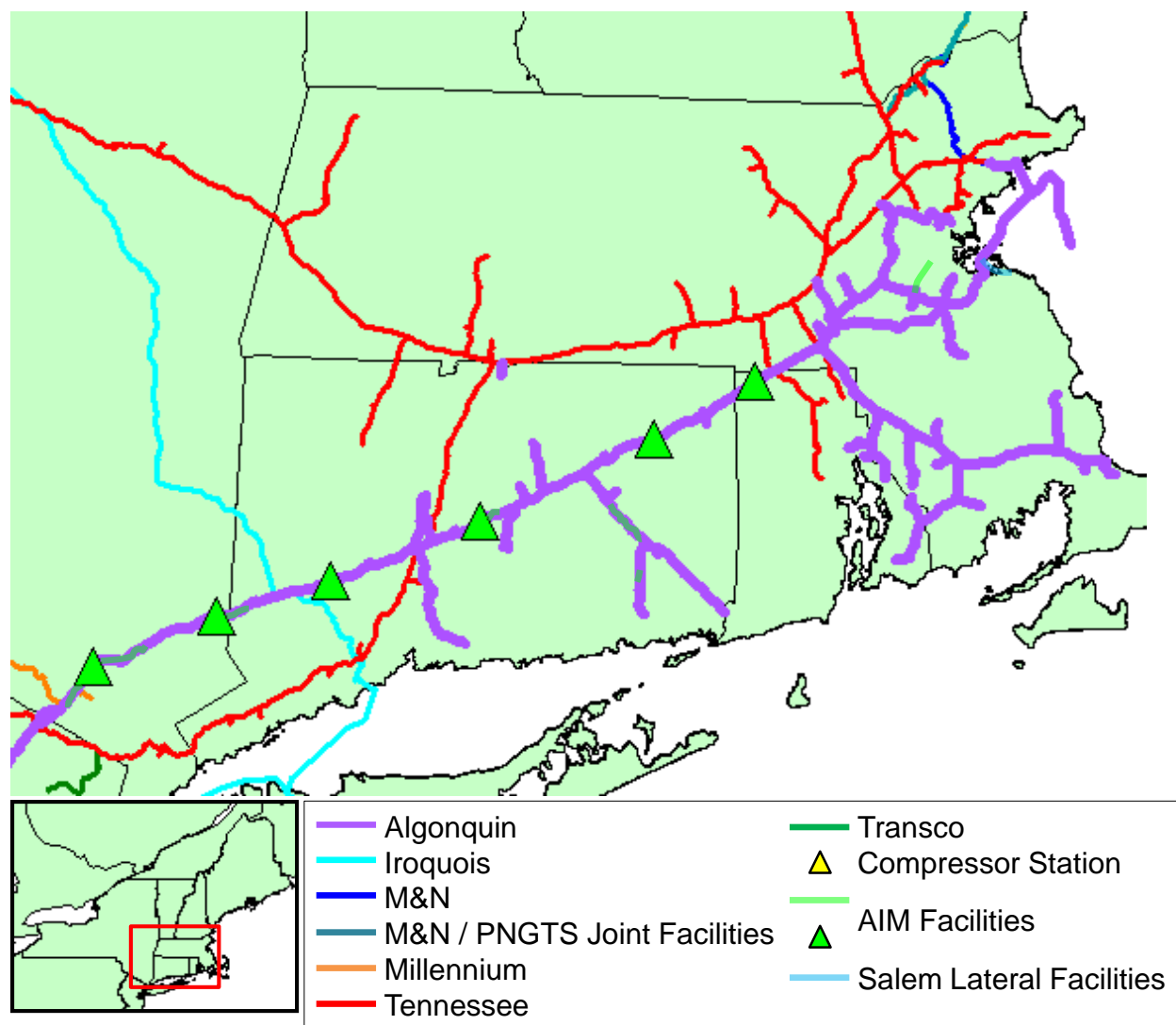
### Algonquin

Three Algonquin projects have been included in the *RGDS*: the AIM Project, the Salem Lateral Project, and a portion of the Atlantic Bridge Project. Known facility improvements associated with these projects are illustrated in Figure B1.

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<sup>1</sup> Pipelines that have projects included in Sensitivity #13 but which do not have any projects included in the *RGDS* include: CNYO&G/Stagecoach (Northern Expansion Project), Columbia Gulf (Rayne Xpress Project), NEXUS Gas Transmission (new pipeline), Northern Border (Bakken Header Project), and PNGTS (Continent to Coast Project).

Figure B1. Algonquin Expansion Project Facilities



The AIM Project will allow Algonquin to provide 342 MDth/d of incremental firm transportation service from its interconnection with Millennium in Ramapo, NY to delivery points in Connecticut, Rhode Island and Massachusetts.<sup>2</sup> The capacity has been contracted by eight LDCs and two municipal utilities,<sup>3</sup> and is currently undergoing FERC review for an anticipated in-service date of November 1, 2016.<sup>4</sup> The total project cost is expected to be approximately \$971.6 million. Significant project components and associated costs are listed in Table B1.

<sup>2</sup> FERC Docket No. CP14-96

<sup>3</sup> The contracting shippers are Columbia Gas of Massachusetts, National Grid (Boston Gas, Colonial Gas and Narragansett Electric), Connecticut Natural Gas, Middleborough Gas and Electric, Norwich Public Utilities, NSTAR Gas, Southern Connecticut Gas and Yankee Gas.

<sup>4</sup> No generators executed precedent agreements for firm transportation entitlements as part of the AIM Project.

Table B1. AIM Project Costs

Project Component	Cost
Burrillville Compressor Station: 15,900 HP and modifications	\$55,547,958
Cromwell Compressor Station: 15,900 HP and modifications	\$50,001,502
Chaplin Compressor Station: 7,700 HP and modifications	\$49,718,001
Stony Point Compressor Station: 15,900 HP and modifications	\$81,950,579
Southeast Compressor Station: 10,320 HP and modifications	\$49,066,882
Haverstraw to Stony Point: Replacement of 3.3 miles of 26" pipe with 42" pipe	\$61,655,825
Stony Point to Yorktown: Replacement of 12.3 miles of 26" pipe with 42" pipe	\$245,416,864
Southeast to MLV 19: Replacement of 4.5 miles of 26" pipe with 42" pipe	110,608,147
Cromwell to Connecticut Loop: 2.0 miles of 26" pipe	\$24,892,995
E-1 System: Replacement of 9.1 miles of 6" pipe with 16" pipe	\$59,113,181
E-1 System Loop: 1.3 miles of 12" pipe	\$13,695,787
Two new meter stations in CT and MA and modifications at 24 meter stations in NY, CT, MA	\$74,590,858
West Roxbury Lateral: 4.2 miles of 16" pipe and 0.9 miles of 24" pipe	\$86,998,703
West Roxbury meter station	\$8,294,402

The Salem Harbor Lateral Project will enable Algonquin to deliver 115 MDth/d to Footprint Power's re-developed Salem Harbor power plant in Essex County, MA via a new 1.2-mile lateral.<sup>5</sup> The target in-service date for the lateral is November 1, 2015. Cost information is not yet publicly available. The capacity associated with this project is lateral-only; no incremental mainline capacity has been contracted by the generator. According to the pre-filing materials, Algonquin expects to file the certificate application for the project no later than July 2014.

As announced, the Atlantic Bridge Project will enable Algonquin and M&N to add 100 to 600 MDth/d of mainline transportation capacity from receipt points as far upstream as Algonquin's interconnection with Texas Eastern in Lambertville, NJ to delivery points as far downstream as Maine.<sup>6</sup> Because the open season notice for the project indicated that an anchor shipper precedent agreement has been executed with Unitil Corporation, 100 Dth/d of incremental capacity have been included in the *RGDS*, with the remainder of the capacity included in Sensitivity 13. Specific project facilities have not been announced, but the planned in-service date is November 2017.

## ANR

Two ANR projects have been included in the *RGDS*: the Glen Karn 2015 Project and the Southeast Mainline Flow Reversal Project.<sup>7</sup> The Glen Karn 2015 Project is designed to increase the capacity of the Lebanon Lateral by 134 MDth/d and provide up to 400 MDth/d of

<sup>5</sup> FERC Docket No. PF14-5

<sup>6</sup> Source: Description of Atlantic Bridge Project on Spectra Energy website: <http://www.spectraenergy.com/Operations/New-Projects-and-Our-Process/New-Projects-in-US/Atlantic-Bridge/>

<sup>7</sup> The Lebanon Lateral 2014 Reversal Project commenced service in April 2014.

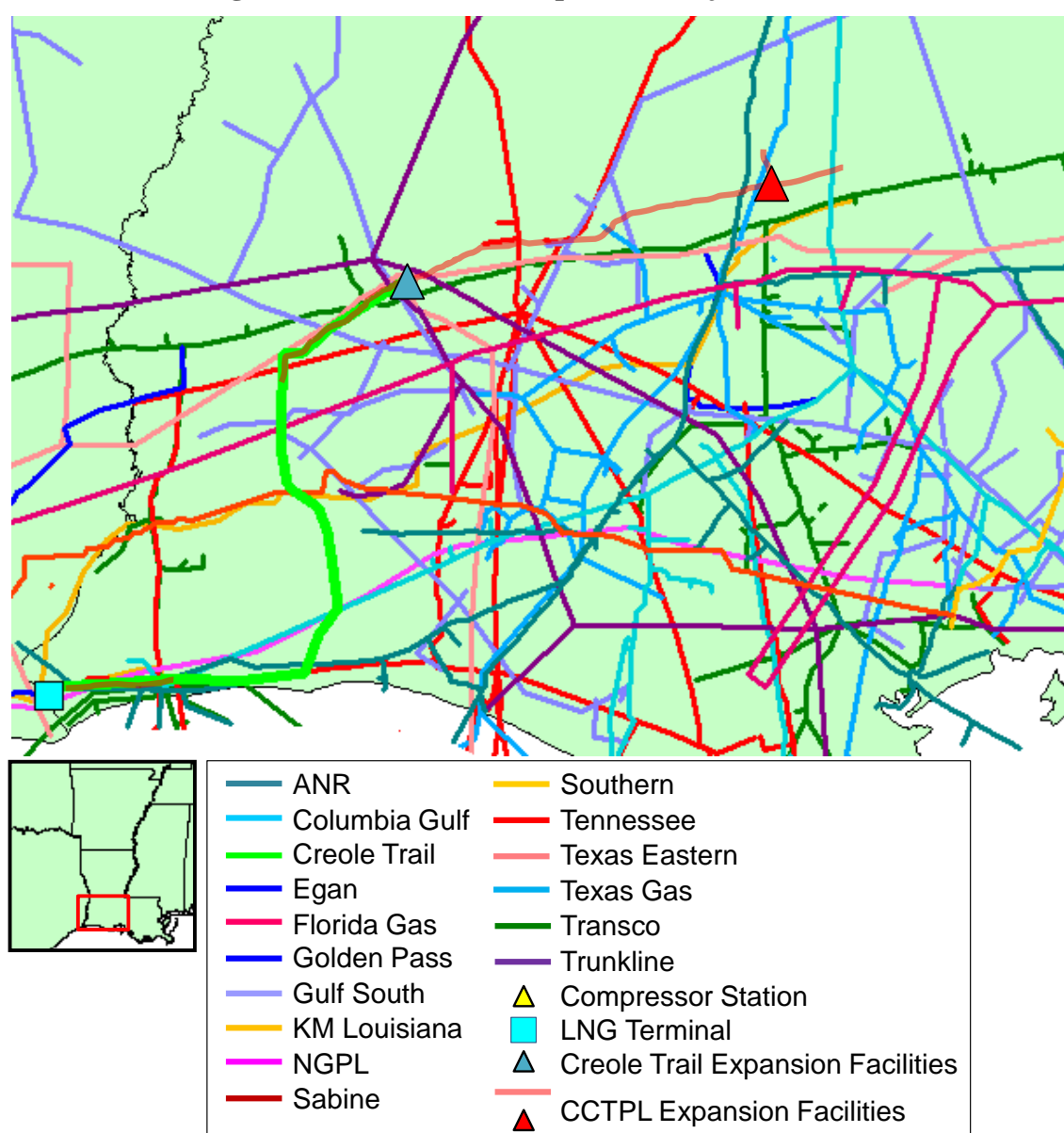
incremental transportation service from ANR’s interconnection with Texas Eastern at Glen Karn, OH to points on ANR’s system. The target in-service date is November 1, 2015.

ANR has announced that the Southeast Mainline Flow Reversal Project has been fully subscribed up to 2 Bcf/d, with 1.25 Bcf/d of flow reversal commencing in 2014 and the remaining volume commencing in 2015.

### Cheniere Creole Trail

Two Cheniere Creole Trail expansion projects have been included in the *RGDS*: the Creole Trail Expansion Project and the CCTPL Expansion Project. The facilities associated with these projects are illustrated in Figure B2.

**Figure B2. Creole Trail Expansion Project Facilities**



The Creole Trail Expansion Project is designed to enable bi-directional flow on the existing Creole Trail system to support Stages 1 and 2 of the Sabine Pass LNG export terminal.<sup>8</sup> The project facilities are separated into two phases, each of which will create 765 MDth/d of firm reverse flow capacity for a total of 1,530 MDth/d at an anticipated cost of \$104.3 million. The Phase 1 project facilities are currently under construction for a 2014 Q4 in-service date, while the Phase 2 facilities are targeted for an early 2016 in-service date. The primary project facilities and associated costs are listed in Table B2.

**Table B2. Creole Trail Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Gillis Compressor Station: New station, 53,125 HP	\$99,766,536
Meter station modifications at existing receipt points	\$ 4,538,619

The CCTPL Expansion Project is designed to provide up to 1.5 Bcf/d of additional firm reverse flow capacity on the Creole Trail system to support Stage 3 of the Sabine Pass LNG export terminal.<sup>9</sup> This project also involves a 48.5-mile extension of the existing pipeline system to new interconnections with ANR, Columbia Gulf, Texas Gas and the Pine Prairie Energy Center. The total estimated cost of the project is \$610.5 million and Creole Trail proposes to complete the facilities by the end of 2015, although Train 5 of the Sabine Pass export terminal is not anticipated to begin operations until December 2018. The primary project facilities and associated costs are listed in Table B3.

**Table B3. CCTPL Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Zone 1 facilities: 38.4 miles of 42" pipe (loop line)	\$207,465,821
Zone 2 pipeline facilities: 52.5 miles of 42" pipe, 13.4 miles of 36" pipe	\$284,689,949
Mamou Compressor Station: New station, 53,125 HP	\$102,828,453
Four new meter stations	\$ 15,559,549

## Columbia Gas

Four Columbia Gas projects have been included in the *RGDS*: the Giles County Project, the Smithfield III Expansion Project, the Line 1570 Project and the East Side Expansion Project.<sup>10,11,12</sup> The known facilities associated with these projects are illustrated in Figure B3.

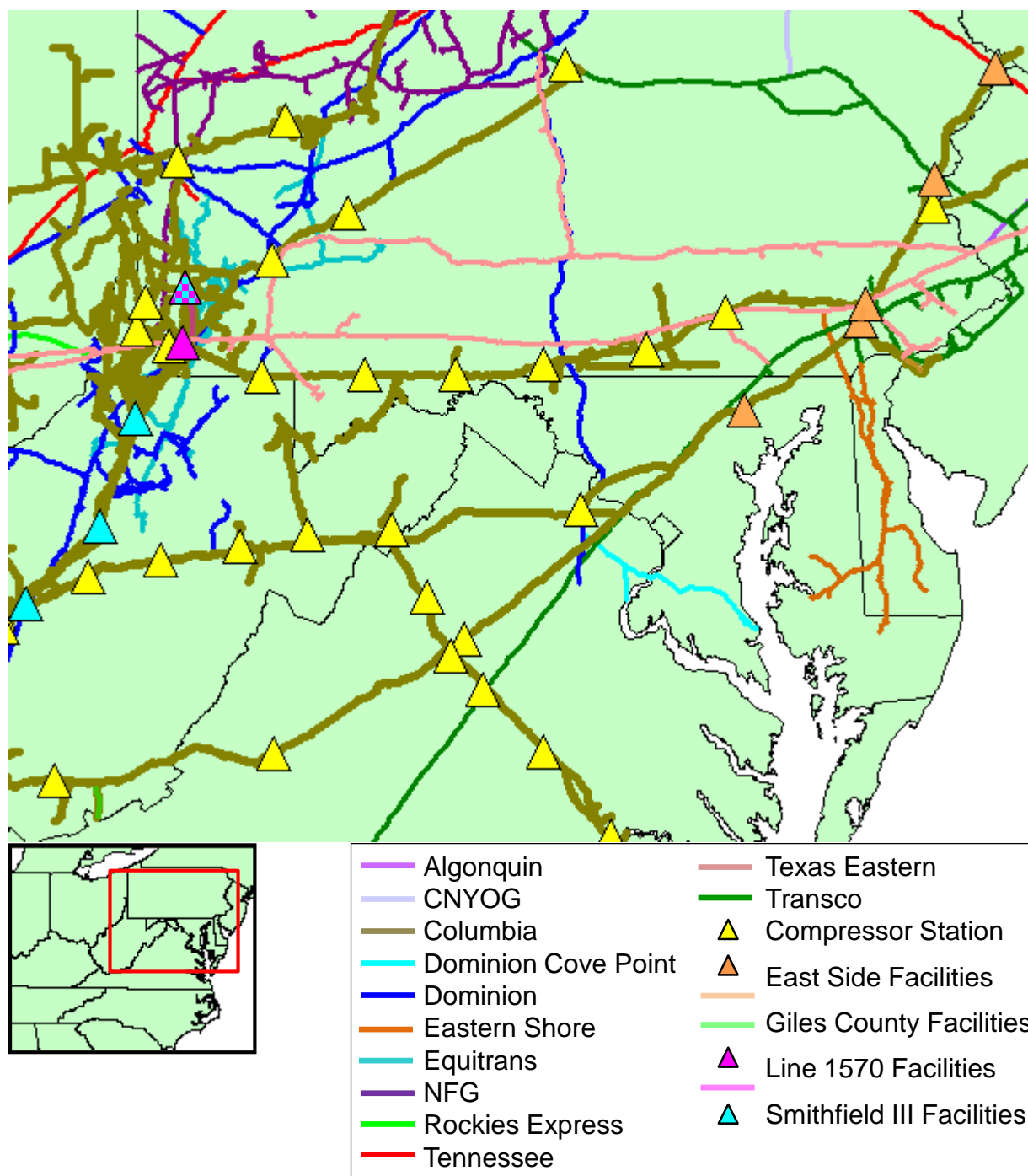
<sup>8</sup> FERC Docket No. CP12-351

<sup>9</sup> FERC Docket No. CP13-552

<sup>10</sup> The VEPCO-Warren County Project was previously listed as an expansion project to be included in this study, but this project has already been constructed and placed in service. Therefore it has been included as part of the infrastructure baseline rather than as an expansion project, although the power plant served by the project is not expected to begin commercial operation until late 2014 or early 2015.

<sup>11</sup> Columbia Gas has also filed several Modernization Program projects to be completed over the study horizon, which do not impact capacity, including FERC Docket Nos. CP13-254, CP13-32, CP13-8 (Line MB Extension Project), CP13-81, CP14-124, CP14-66, CP14-77 and CP14-99.

Figure B3. Columbia Gas Expansion Project Facilities<sup>13</sup>



<sup>12</sup> Columbia Gas’s Leach Xpress and QuickLink Projects are included in Sensitivity #13 and summarized in Appendix C.

<sup>13</sup> Compressor stations shaded in a multi-color pattern indicate that multiple projects (corresponding to the colors used) involve facility modifications at those stations.

The Giles County Project will enable Columbia Gas to provide 46 MDth/d of incremental lateral capacity to Celanese Acetate LLC, an industrial customer located in Giles County, VA that is converting its coal-fired boilers with natural gas-fired boilers.<sup>14</sup> The 12.6 miles of 8” loop line and associated facilities are estimated to cost \$22.7 million. The project is currently under construction for an October 1, 2014 in-service date.

The Smithfield III Expansion Project will enable Columbia Gas to transport 444 MDth/d from receipt points in southwestern Pennsylvania and West Virginia to its interconnection with Columbia Gulf at Leach, KY.<sup>15</sup> The shippers for this project are three shale producers, Antero Resources Appalachian Corporation, Rice Drilling B LLC and PetroEdge Energy, LLC. The project facilities are currently under construction, with all components expected to be in service by November 1, 2014. The total project cost is estimated to be \$81.8 million. The primary cost components are listed in Table B4.

**Table B4. Smithfield III Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Redd Farm Compressor Station: New station, 9,400 HP <sup>16</sup>	\$20,102,469
Glenville Compressor Station: 15,600 HP and associated facilities	\$44,071,844
Appurtenant and Auxiliary Facilities: Valve settings and compressor station modifications	\$17,604,765

The Line 1570 Project is a system modernization project that was expanded to create 99 MDth/d of incremental capacity on Columbia Gas’s Line 1570 in southwestern Pennsylvania.<sup>17</sup> The incremental capacity has been contracted by two producers, Range Resources – Appalachia, LLC and Rice Drilling B, LLC. The total project cost is estimated to be \$121.7 million, of which \$17.8 million is allocated to expansion capacity. The cost components are listed in Table B5. The project is currently under construction for a November 1, 2014 in-service date.

**Table B5. Line 1570 Project Costs**

<b>Project Component</b>	<b>Cost</b>
Pipeline: Replacement of 18.52 miles of 20” pipe with 24” pipe	\$86,696,898
Waynesburg Compressor Station: Replacement of three 1.080 HP compressor units with a single 4,700 HP compressor	\$24,993,354
Redd Farm Compressor Station: <sup>18</sup> 6,400 HP	\$10,049,170

<sup>14</sup> FERC Docket No. CP13-125

<sup>15</sup> FERC Docket No. CP13-477

<sup>16</sup> 3,000 HP at the Redd Farm Compressor Station will be allocated to the Smithfield III Expansion Project, with the remainder allocated to the Line 1570 Project

<sup>17</sup> FERC Docket No. CP13-478

<sup>18</sup> A portion of the Redd Farm Compressor Station constructed as part of the Smithfield III Expansion Project has been allocated to the Line 1570 Project.

The East Side Expansion Project will expand the Columbia Gas system by 312 MDth/d to serve mid-Atlantic and northeast citygate markets.<sup>19</sup> The contracted shippers for this project include producers, marketers and LDCs: Cabot Oil & Gas Corporation, New Jersey Natural Gas Company, Southwestern Energy Services Company, South Jersey Gas Company, and South Jersey Resources Group, LLC. The project, which shown in Table B6, is estimated to cost \$268.5 million, is currently undergoing FERC review for an anticipated September 1, 2015 in-service date.

**Table B6. East Side Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Pipeline: 9.5 miles of 26" loop line, 9.5 miles of 20" loop line	\$163,372,000
Compression: Replacement of 680 HP with 9,400 HP at Milford Compressor Station, replacement of 4,480 HP with 21,604 HP at Easton Compressor Station, modifications to allow bi-directional operations at Eagle and Rutledge Compressor Stations	\$ 99,579,000
Meter stations: Modifications at three stations	\$ 6,544,000

### **Constitution & Iroquois**

The Constitution Pipeline has been included in the *RGDS*.<sup>20</sup> Constitution is a new 122-mile pipeline that will transport 650 MDth/d of natural gas from the Marcellus shale production area in northeastern Pennsylvania an interconnection with Iroquois and Tennessee near Wright, NY, as illustrated in Figure B4.<sup>21</sup> The project has been fully contracted by two producers, Cabot Oil & Gas Corporation and Southwestern Energy Services Company, and is estimated to cost \$683 million; the cost components are listed in Table B7. The target in-service date listed in the project's certificate application is March 31, 2015.<sup>22</sup>

**Table B7. Constitution Project Costs**

<b>Project Component</b>	<b>Cost</b>
Pipeline: 122 miles of 30" pipe	\$668,554,840
Two meter stations	\$ 14,256,160

In conjunction with the Constitution Pipeline Project, Iroquois has proposed the Wright Compressor Station Project, which would enable the existing Wright Compressor Station to flow gas bi-directionally, receiving up to 650 MDth/d from Constitution for delivery into Iroquois and Tennessee.<sup>23</sup> The capacity created by the compressor station modifications will be leased to

<sup>19</sup> FERC Docket No. CP14-17

<sup>20</sup> Iroquois's South to North Project is included in Sensitivity #13 and summarized in Appendix C.

<sup>21</sup> FERC Docket No. CP13-499

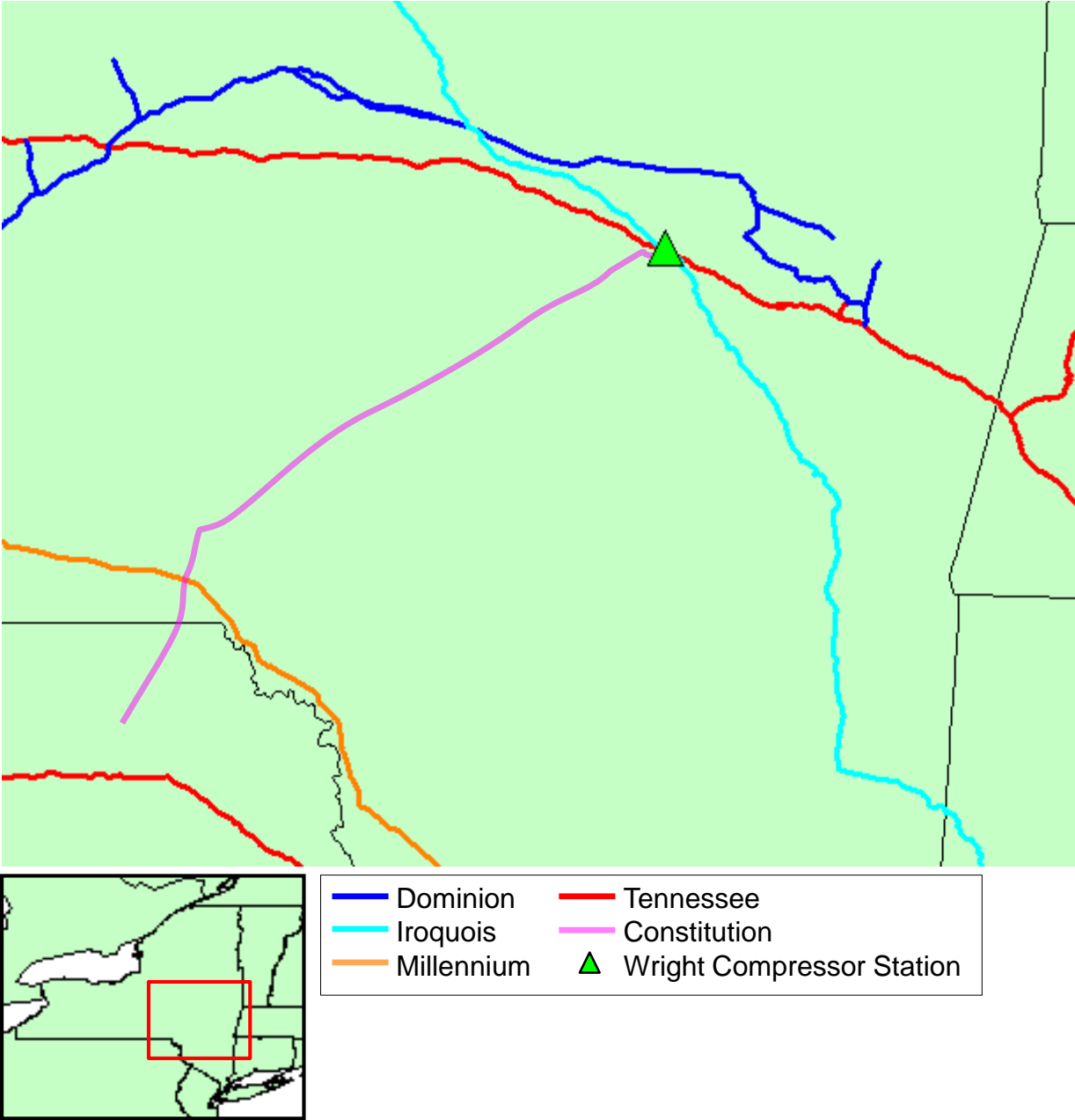
<sup>22</sup> Constitution requested FERC approval of the project by April 27, 2014 to meet the March 31, 2015 in-service date. On December 13, 2013, FERC announced a planned schedule that calls for issuance of the project's final Environmental Impact Statement by June 13, 2014, with the resultant 90-day Federal Authorization Decision Deadline on September 11, 2014. The draft Environmental Impact Statement was issued on February 12, 2014.

<sup>23</sup> FERC Docket No. CP13-502



Constitution following construction, the project facilities will enter service simultaneously with the Constitution pipeline. The estimated cost of the modifications is \$75 million.

**Figure B4. Constitution and Iroquois Expansion Project Facilities**

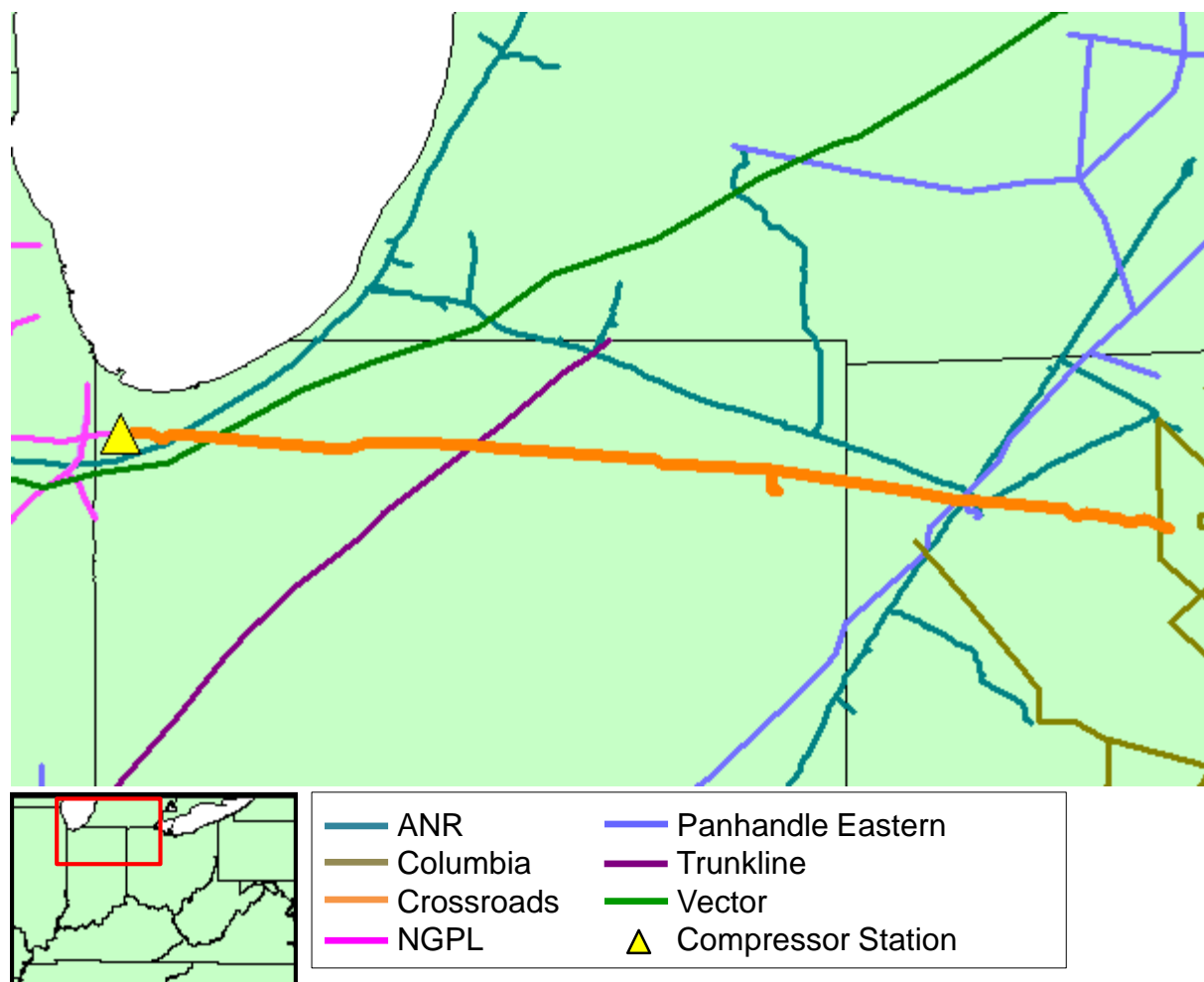


**Crossroads**

One Crossroads project, the Unity Pipeline Diluent Project has been included in the *RGDS*. This project involves the conversion of the Crossroads pipeline, shown in Figure B5, from a natural

gas transporter to diluent, or natural gas liquids, service as one component of a new pipeline system.<sup>24</sup> The project’s open season notice reports an anticipated mid-2015 in-service date for the liquids pipeline.

**Figure B5. Location of Crossroads Facilities**



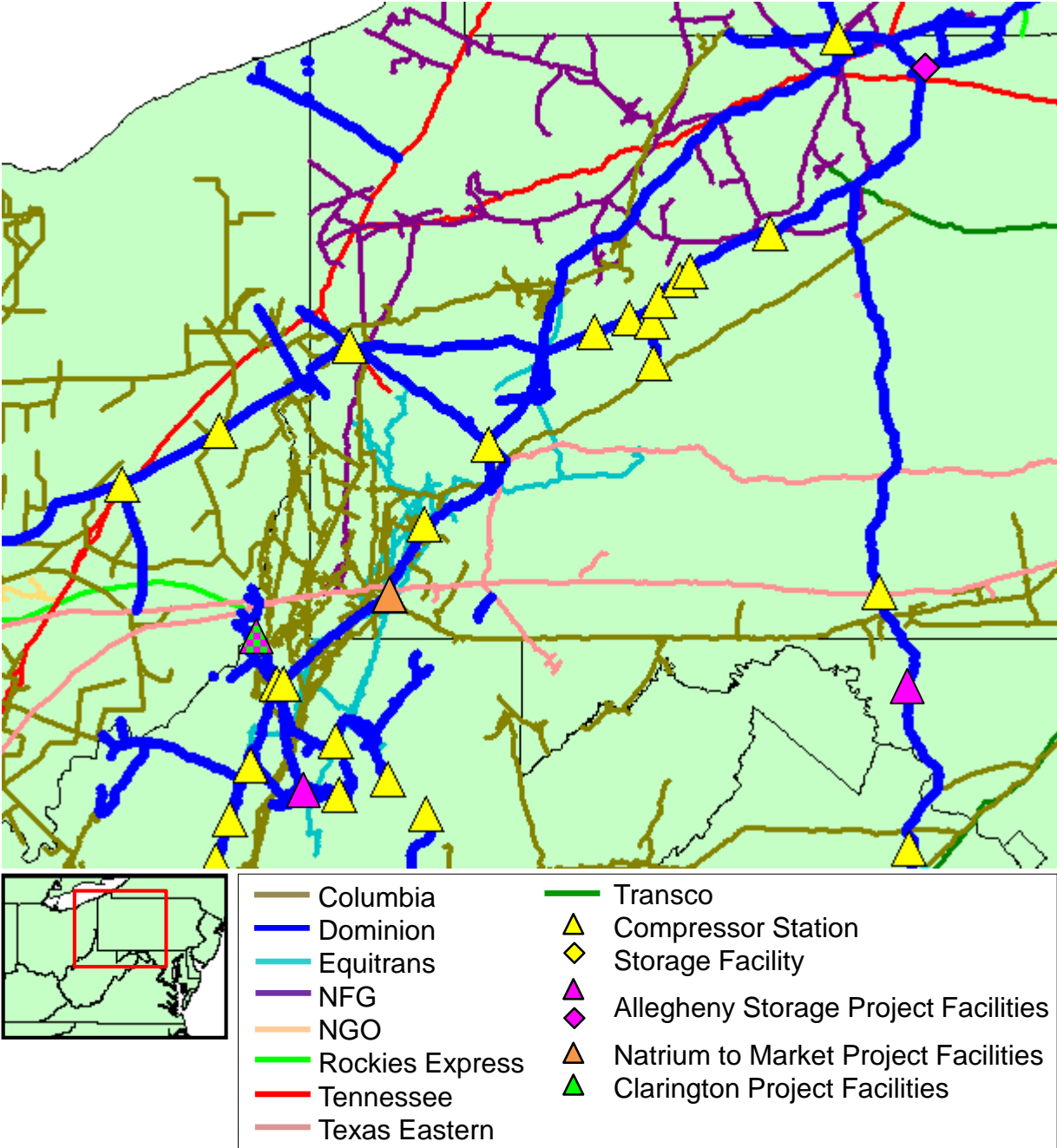
**Dominion**

Three Dominion projects have been included in the *RGDS*: the Allegheny Storage Project, the Natrium to Market Project and the Clarington Project.<sup>25</sup> The known facilities associated with these projects are illustrated in Figure B6.

<sup>24</sup> <http://www.unitypipeline.com/>

<sup>25</sup> Dominion’s New Market to Albany and Lebanon West Projects are included in Sensitivity #13 and summarized in Appendix C.

Figure B6. Dominion Expansion Project Facilities



The Allegheny Storage Project will enable Dominion to provide a total of 115 MDth/d of incremental firm transportation service and 125 MDth/d of incremental storage service to three LDCs in PJM (Baltimore Gas & Electric, TW Phillips, and Washington Gas and Light), primarily through the addition of compression.<sup>26,27</sup> The estimated total construction cost for the

<sup>26</sup> FERC Docket No. CP12-72

proposed facilities is \$112 million, the major components are listed in Table B8. The project is currently under construction for a November 1, 2014 in-service date.

**Table B8. Allegheny Storage Project Costs**

<b>Project Component</b>	<b>Cost</b>
Myersville Compressor Station: New station, 16,000 HP	\$61,089,151
Mullett Compressor Station: New station, 3,550 HP	\$26,538,362
Wolf Run Compressor Station: Incremental dehydration capability	\$ 3,262,925
Sabinsville Storage Station and Pool modifications	\$19,373,996
Meter station facilities	\$ 2,050,871

The Natrium to Market Project will enable Dominion to provide 185 MDth/d of incremental firm transportation from the Dominion Natrium processing facility in Marshall County, WV to an interconnection with Texas Eastern in Greene County, PA.<sup>28</sup> Four producers have executed precedent agreements for the full capacity: Chesapeake Energy Marketing, Inc., HG Energy, LLC, BP Energy Company and TOTAL Gas and Power North America, Inc. The project facilities, the major component of which is 7,700 HP of incremental compressor at the Crayne Compressor Station, are currently under construction for a November 1, 2014 in-service date. The total project cost is estimated to be \$41.7 million.

The Clarington Project will enable Dominion to transport 250 MDth/d from a producer interconnection in Marshall County, WV to new interconnections with Rockies Express and Texas Eastern in Monroe County, OH.<sup>29,30</sup> The customer for the full volume of the project is CNX Gas Company, LLC. The incremental capacity will be created through incremental compression at two existing stations, detailed in Table B9, and other appurtenant facilities. The facilities are estimated to cost \$76.7 million, and the target in-service date for the project is November 1, 2016.

**Table B9. Clarington Project Costs**

<b>Project Component</b>	<b>Cost</b>
Burch Ridge Compressor Station: 6,130 HP and modifications	\$30,117,287
Mullett Compressor Station: 10,000 HP and modifications	\$29,622,371
Two new meter stations and pipeline connections	\$\$16,821,90

<sup>27</sup> TW Phillips contracted for 10 MDth/d of firm transportation capacity that did not require facility upgrades.

<sup>28</sup> FERC Docket No. CP13-13

<sup>29</sup> FERC Docket No. CP14-496

<sup>30</sup> This project has been previously referred to as the WV West Project. The project's open season notice was for up to 500 MDth/d, the other half of which was to be modeled as part of Sensitivity #13. Because the incremental 250 MDth/d is not included in the project as filed at FERC, it has been removed from Sensitivity 13.

## Dominion Cove Point

One Dominion Cove Point expansion project, the Cove Point Liquefaction Project, has been included in the *RGDS*. This project includes modifications to an existing compressor station on the Dominion Cove Point pipeline that will enable up to 860 MDth/d to flow in from west to east on the existing pipeline facilities to serve the Cove Point LNG terminal's proposed export capability.<sup>31</sup> The LNG terminal's export customers – Pacific Summit Energy, LLC, which is a subsidiary of Sumitomo Corporation, and a U.S. subsidiary of GAIL (India) Limited – have also contracted for the corresponding transportation capacity on the pipeline. The pipeline facility modifications listed in Table B10 are expected to cost \$126.3 million, and the receipt point allocation at the time the certificate application was filed with FERC calls for 490 MDth/d to be received from Transco at Pleasant Valley and 360 MDth/d to be received at Loudoun, split evenly between Columbia and Dominion. The anticipated in-service date for the pipeline facilities is March 2017. The Environmental Assessment for the project was issued on May 15, 2014.

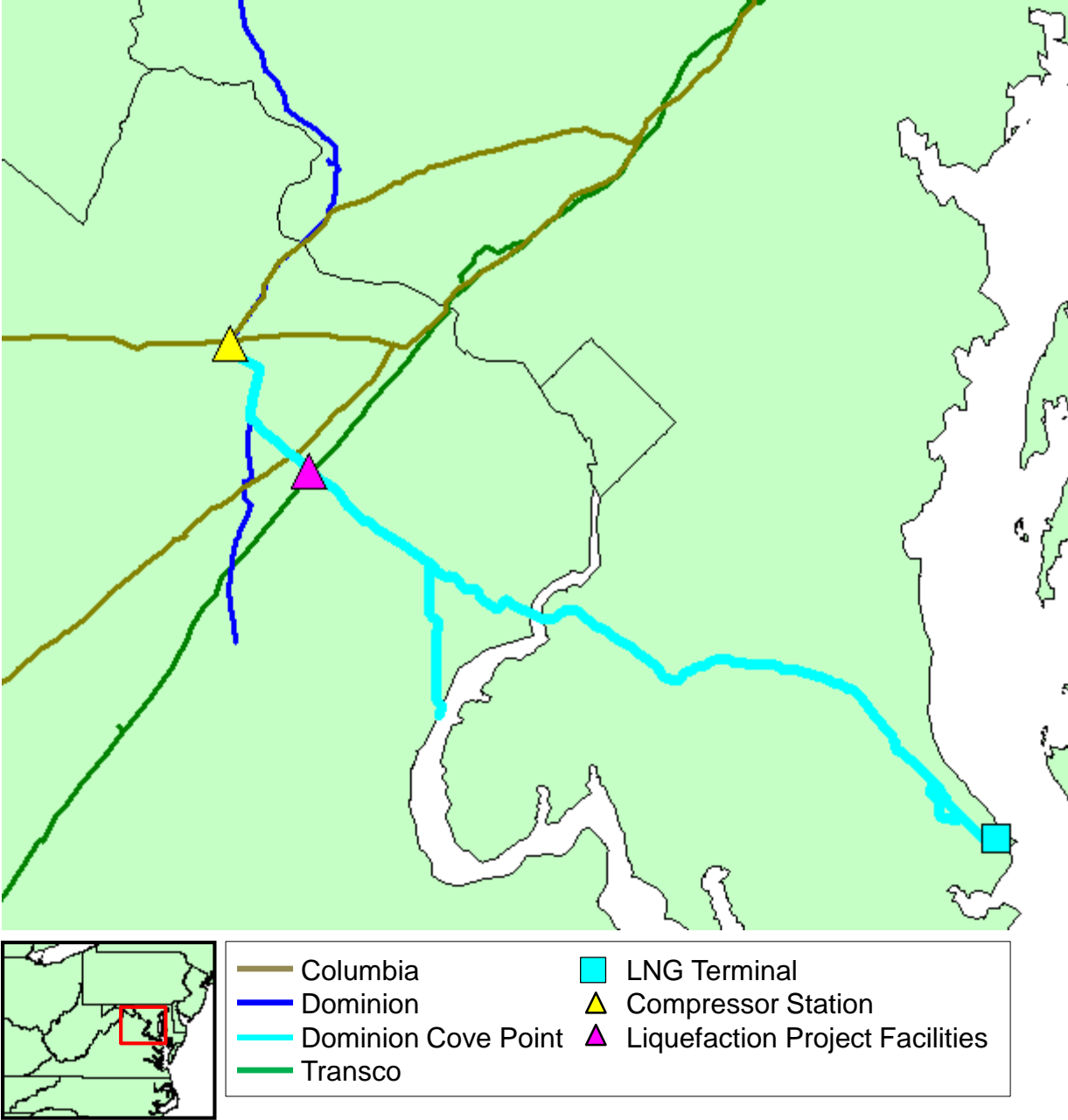
**Table B10. Cove Point Liquefaction Project Costs**

<b>Project Component</b>	<b>Cost</b>
Pleasant Valley Compressor Station: 62,500 HP and modifications	\$119,269,647
Pleasant Valley meter station modifications	\$ 4,916,713
Loudoun meter station modifications	\$ 2,106,175

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<sup>31</sup> FERC Docket No. CP13-113

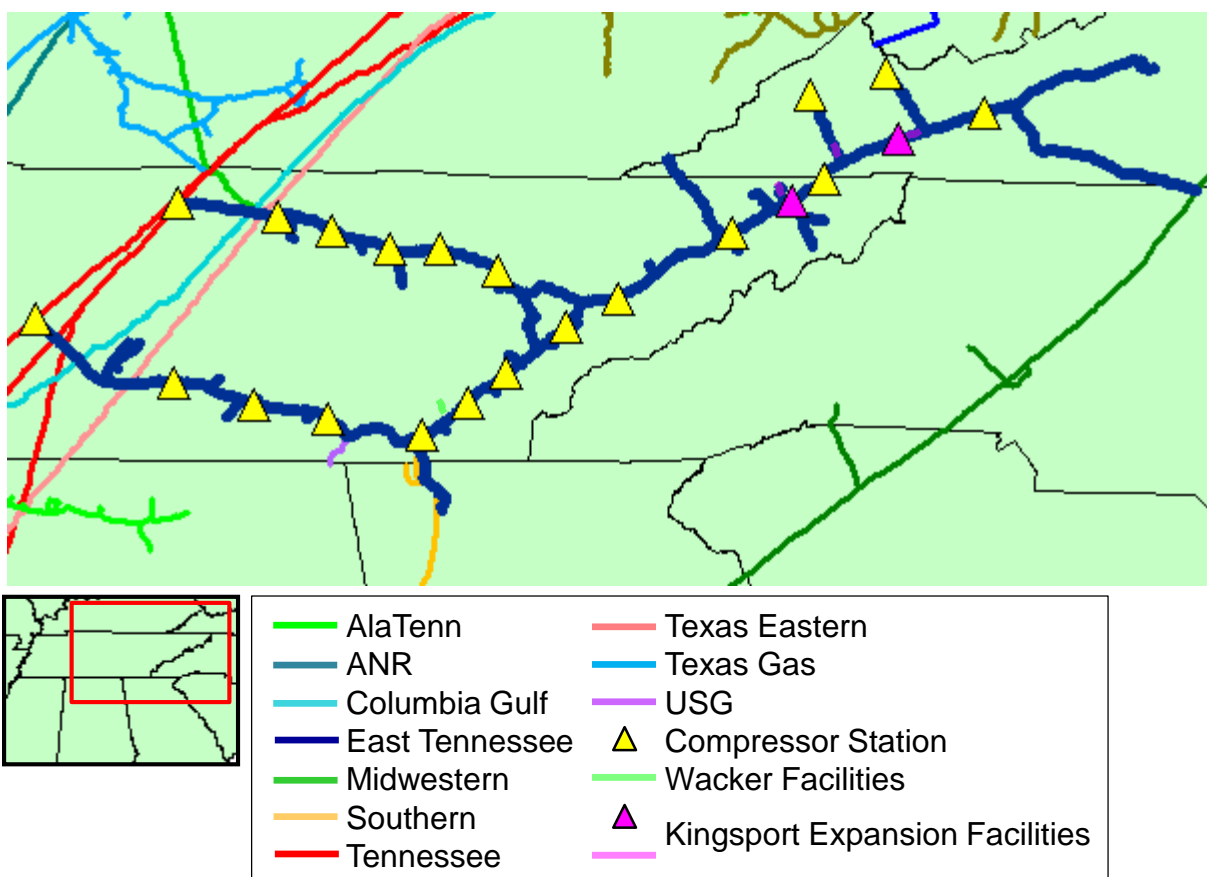
Figure B7. Dominion Cove Point Expansion Project Facilities



**East Tennessee**

Two East Tennessee projects have been included in the *RGDS*: the Kingsport Expansion project and the Wacker Project. The facilities associated with these projects are illustrated in Figure B8.

**Figure B8. East Tennessee Expansion Project Facilities**



The Wacker Project will enable East Tennessee to provide 5.7 MDth/d of firm transportation service to the new Wacker Polysilicon North America LLC manufacturing facility in Bradley County, TN, of which 3 MDth/d is existing unsubscribed capacity and 2.7 MDth/d is incremental capacity from East Tennessee’s Mount Pleasant interconnection with Texas Eastern.<sup>32</sup> The total project cost, broken down by component in Table B11, is estimated to be \$4.8 million. Facilities are currently under construction for a summer 2014 in-service date.

**Table B11. Wacker Project Costs**

<b>Project Component</b>	<b>Cost</b>
Lateral: 2,800 feet of 8” pipe <sup>33</sup>	\$2,248,645
New meter station and appurtenant facilities	\$2,526,523

The Kingsport Expansion Project is designed to provide 61 MDth/d of incremental firm transportation service to the Eastman Chemical Company from East Tennessee’s existing

<sup>32</sup> FERC Docket No. CP12-484

<sup>33</sup> Following approval by FERC, the lateral route was adjusted to be 2,666 feet long, but an updated cost estimate was not provided with the re-route request.

Cascade Creek interconnection with Transco to a new delivery point in Sullivan County, TN.<sup>34</sup> Eastman Chemical is converting the boilers at an existing chemical plant from coal to natural gas. Project facilities include loop line, new right-of-way and compression, as detailed in Table B12. The total estimated cost of the facilities, which is currently under construction for a January 1, 2015 in-service date, is \$113.5 million.

**Table B12. Kingsport Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Eastman Mainline Extension: 6.5 miles of 16" pipe	\$47,613,454
Glade Spring Relay: Replacement of 5.7 miles of 8" pipe with 24" pipe	\$35,233,535
Nora Line Loop: 3.3 miles of 16" pipe	\$21,357,149
Fordtown and Glade Spring Compressor Station modifications	\$ 3,645,782
New meter station and other appurtenant facilities	\$ 5,688,802

### **Eastern Shore**

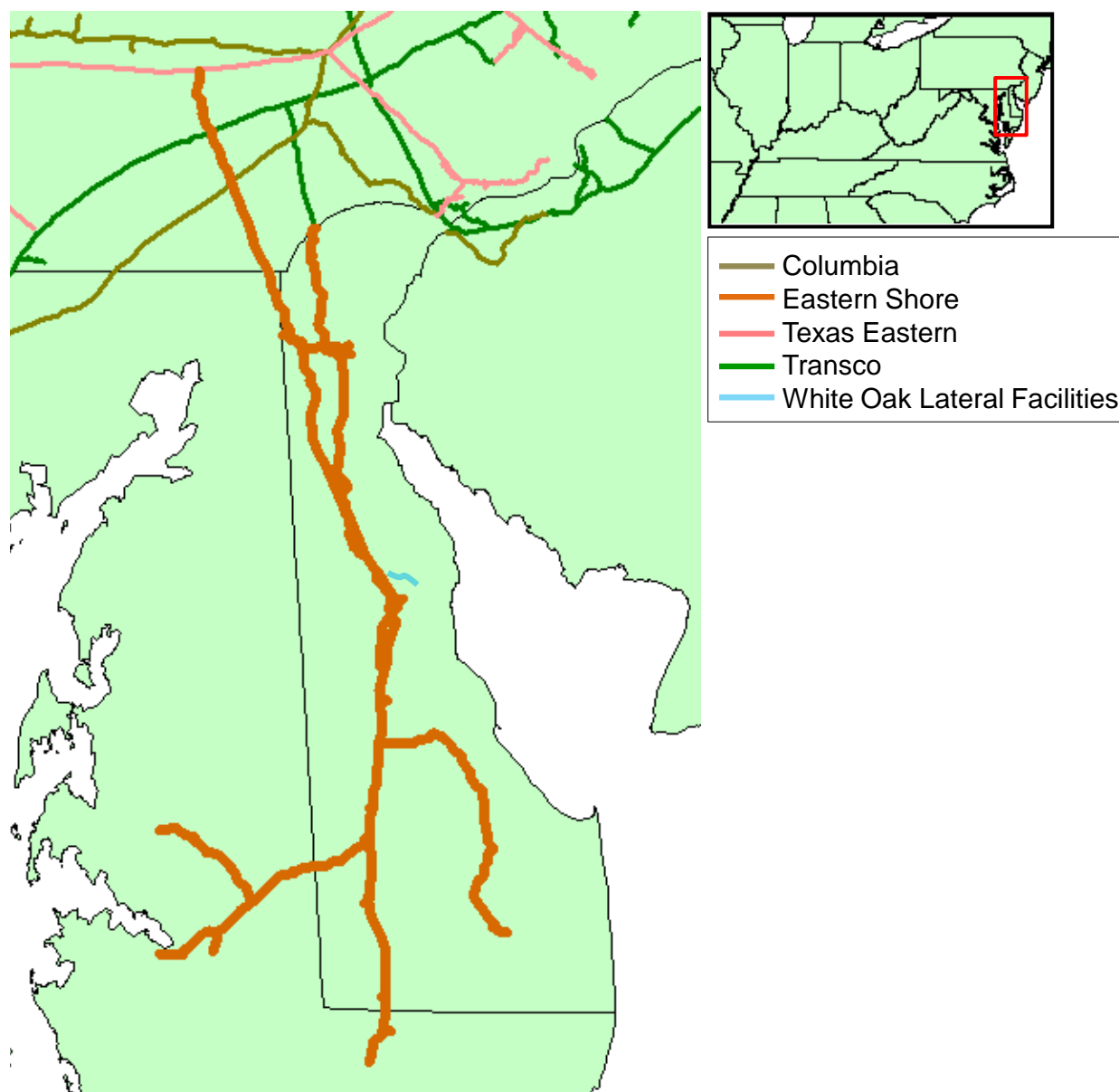
Two Eastern Shore projects have been included in the *RGDS*: the TETCO Supply Expansion Project and the White Oak Lateral Project. The facilities associated with these projects are illustrated in Figure B9.

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<sup>34</sup> FERC Docket No. CP13-534



Figure B9. Eastern Shore Expansion Project Facilities



The TETCO Supply Expansion Project is designed to increase Eastern Shore's receipt capacity at the Honey Brook interconnect with Texas Eastern from 50 MDth/d to 107 MDth/d by the target in-service date of April 1, 2014.<sup>35</sup> This project, which requires only minor modifications to the existing interconnection facilities, allows the shipper, Delaware City Refinery Company, to have additional receipt point flexibility for its existing transportation contracts, but does not increase the delivery capacity of the Eastern Shore system. The estimated cost of the interconnection improvements is \$0.3 million.

<sup>35</sup> FERC Docket No. CP14-67

The White Oak Lateral Project will enable Eastern Shore to provide up to 55.2 MDth/d of firm lateral transportation service to Calpine Energy’s Garrison Energy Center.<sup>36</sup> No upstream incremental transportation capacity is created through the construction of this project. The total project cost, including the 5.5-mile 16” lateral, is expected to be \$11.2 million. The project facilities are currently under construction for an October 1, 2014 in-service date.

### Empire / NFG

The *RGDS* includes one joint Empire/NFG project, the Tuscarora Lateral Project, and three NFG projects: the Mercer Expansion Project, the Northern Access 2015 Project, and the West Side Expansion and Modernization Project.<sup>37,38</sup> The facilities associated with these projects are illustrated in Figure B10.

**Figure B10. Empire / NFG Expansion Project Facilities**



The Tuscarora Lateral Project involves the construction of a new 17-mile lateral between the NFG and Empire systems and the lease of NFG capacity by Empire.<sup>39</sup> By leasing facilities from NFG, Empire will be able to offer firm no-notice and storage service to New York State Electric & Gas and Rochester Gas & Electric, both LDCs operating in New York. The total estimated cost of the project is \$34.1 million, most of which is related to construction of the lateral, as shown in Table B13. The project is currently under FERC review, for a November 1, 2015 in-service date.

**Table B13. Tuscarora Lateral Project Costs**

<b>Project Component</b>	<b>Cost</b>
Tuscarora Lateral: 16.35 miles of 12” pipe and 0.77 miles of 16” pipe	\$30,068,659
Oakfield Compressor Station modifications	\$1,500,000
New meter station	\$2,493,280

The Mercer Expansion Project will allow NFG to provide 105 MDth/d of incremental firm transportation service to a Marcellus shale producer from a receipt point in southwestern

<sup>36</sup> FERC Docket No. CP13-498

<sup>37</sup> Two additional NFG projects, the Line KNY and KM3 Replacement Project (FERC Docket No. CP14-107) and the Line TNY Replacement Project (FERC Docket No. CP14-89), are scheduled to come online in September and October 2014, respectively, but will not create any incremental capacity.

<sup>38</sup> Empire’s Central Tioga County Extension and Clermont to Chippawa Projects and NFG’s Clermont to Transco Project are included in Sensitivity #13 and summarized in Appendix C.

<sup>39</sup> FERC Docket No. CP14-112

Pennsylvania to a new interconnection with Tennessee in Mercer County, PA.<sup>40</sup> The estimated project costs are listed in Table B14, the total cost is expected to be \$30.4 million. The facilities are currently under construction for a November 1, 2014 in-service date.

**Table B14. Mercer Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Pipeline: Replacement of 2.05 miles of 20" pipe with 24" pipe	\$5,800,000
Mercer Compressor Station: New station, 3,550 HP	\$21,500,000
Interconnection facilities	\$3,100,000

The Northern Access 2015 Project involves the creation of 140 MDth/d of incremental capacity between two interconnections with Tennessee that will be subsequently leased to Tennessee in conjunction with the Niagara Expansion Project.<sup>41</sup> The project facilities, listed in Table B15, are expected to cost \$65.7 million. The project is currently under review by FERC for a November 1, 2015 in-service date, with issuance of the Environmental Assessment currently scheduled for mid-July 2014.

**Table B15. Northern Access 2015 Project Costs**

<b>Project Component</b>	<b>Cost</b>
Hinsdale Compressor Station: New station, 15,400 HP	\$42,573,859
Concord Compressor Station: 7,700 HP and modifications	\$21,819,292
East Eden interconnection modifications	\$ 1,352,650

The West Side Expansion and Modernization Project will enable NFG to provide 175 MDth/d of incremental capacity between production receipt points and interconnections with Tennessee at Mercer and Texas Eastern at Holbrook.<sup>42</sup> Two producers have executed precedent agreements for project capacity: Range Resources – Appalachia, LLC (145 MDth/d) and Seneca Resources Corporation (30 MDth/d). The incremental capacity is created by upsizing the pipe as part of NFG's ongoing maintenance and replacement program. The total cost of the project components, which is listed in Table B16, is expected to be \$76.1 million. The target in-service date, is November 1, 2015.

**Table B16. West Side Expansion and Modernization Project Costs**

<b>Project Component</b>	<b>Cost</b>
Line N Pipeline: Replacement of 23.23 miles of 20" pipe with 24" pipe	\$65,233,035
Mercer Compressor Station: 3,550 HP and modifications	\$10,240,433
Henderson Compressor Station modifications	\$ 649,219

<sup>40</sup> FERC Docket No. CP13-530

<sup>41</sup> FERC Docket No. CP14-100

<sup>42</sup> FERC Docket No. CP14-70

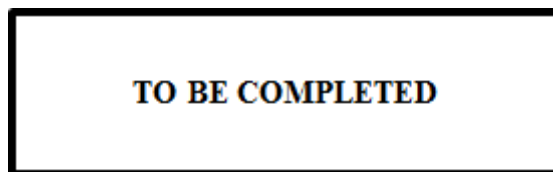
## Enable

The Central Arkansas Pipeline Enhancement Project, which will modernize segments of Enable's system to ensure continued reliable service to existing customers and has an October 2014 target in-service date, has not been included in the *RGDS* because no incremental capacity is created.

## Equitrans

Four Equitrans projects have been included in the *RGDS*: the H-164 Pipeline Project, the H-305 Pipeline Project, the Jefferson Compressor Station Expansion Project and the West Uprate and Blacksville Compressor Station Expansion Project.<sup>43</sup> The known facilities associated with these projects are illustrated in Figure B11.

**Figure B11. Equitrans Expansion Project Facilities**



The Jefferson Compressor Station Expansion Project involves the addition a 12,913 HP to the Jefferson Compressor Station in Greene County, PA, allowing the station to increase its throughput capacity by approximately 600 MDth/d.<sup>44</sup> One shipper has signed a precedent agreement for 295 MDth/d. The cost of the incremental horsepower and related facilities is estimated to be \$30.8 million. The project is currently under construction for an in-service date in the third quarter of 2014.

The H-164 Pipeline Project will enable Equitrans to transport 475 MDth/d on a new 3.3-mile 12" line in Greene County, PA between the Jupiter Gathering System and the Morris interconnection with Texas Eastern. The project facilities are estimated to cost \$11.1 million and targeted to be in service on October 15, 2014.

The H-305 Pipeline Project will enable Equitrans to transport 100 MDth/d between the Jupiter Gathering System in Greene County, PA and the Braden Run interconnection with Texas Eastern.<sup>45</sup> One-half of the contracted capacity will be new, created by the construction of a 3.4-mile 24" pipe between the Jupiter Gathering System and the Braden Run interconnection. The new line is estimated to cost \$13.8 million. The projected in-service date is November 15, 2014.

For the West Uprate and Blacksville Compressor Station Expansion Project, Equitrans proposes to increase the MAOP of several segments from 605 psig to 655 psig and install two additional units totaling 9,470 HP and related modifications at the Blacksville Compressor Station in

<sup>43</sup> Equitrans' Ohio Valley Connector Project has been included in Sensitivity #13 and is summarized in Appendix C.

<sup>44</sup> FERC Docket No. CP13-547

<sup>45</sup> FERC Docket No. CP14-130

Monongalia County, WV.<sup>46</sup> These facilities will create up to 100 MDth/d of incremental capacity on the Equitrans mainline for delivery to interconnections with Dominion and Texas Eastern. The cost of the facilities is estimated to be \$26.6 million, and the target in-service date is December 31, 2014.

### Great Lakes

The Great Lakes MAOP Reduction Project has been included in the *RGDS*. The project includes a reduction in the operating pressure of the Great Lakes system between the Canada/US border and Compressor Station 5 in Minnesota that will reduce summer and winter daily design capacity by 193 MDth/d and 229 MDth/d, respectively.<sup>47</sup> The location of the derated segment is shown in Figure B12. Due to system decontracting, which occurs when transportation contracts end and are not renewed or picked up by another shipper, the de-rate is not expected to affect Great Lakes's ability to meet firm customer demands. The de-rate will be temporary for three years while Great Lakes determines whether market conditions warrant maintaining certificated capacity levels or permanent abandonment of the capacity.

**Figure B12. Great Lakes MAOP Reduction Project Facilities**



### Gulf Crossing Pipeline

Gulf Crossing's Panda Power Lateral Project was previously targeted for inclusion in the *RGDS*. However, the lateral and power plant served by the lateral are outside of the Study Region, and no incremental upstream capacity is created.<sup>48</sup> The project has therefore not been included in the *RGDS*.

### Gulf South

Gulf South's Southeast Market Expansion Project has been included in the *RGDS*. This project involves the construction of 70 miles of new pipe and the lease of existing capacity on the Petal Gas Storage system to transport gas produced in Texas, Oklahoma and Louisiana to southeast markets.<sup>49</sup> The new facilities to be constructed for this project are illustrated in Figure B13. The estimated cost of building the facilities to provide 510.5 MDth/d of capacity to the project shippers is \$283.8 million. Four shippers have contracted for the full project capacity, Gulf South describes them as electric power generators and industrial end-users. The new facility components of the project are listed in Table B17.

<sup>46</sup> FERC Docket No. CP14-492

<sup>47</sup> FERC Docket No. CP14-116

<sup>48</sup> FERC Docket No. CP13-64

<sup>49</sup> FERC Docket No. P13-96

**Figure B13. Gulf South Expansion Project Facilities****Table B17. Southeast Market Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Pipeline: 42 miles of 30" pipe and 28 miles of 24" pipe	\$201,148,000
Jasper Compressor Station: New station, 15,900 HP	\$ 30,091,000
Forrest Compressor Station: New station, 15,900 HP	\$ 31,539,000
Moss Point Compressor Station: 2,415 HP and modifications	\$ 13,690,000
Other related facilities: Interconnection and tie-in	\$ 7,377,000

### Midwestern

Midwestern's MGT Lateral was previously announced for inclusion in the *RGDS*. However, the project, which involved a new lateral to serve a power plant in Paradise, KY, has been withdrawn from the FERC pre-filing process due to notification from the customer that the lateral was no longer needed.<sup>50,51</sup> This project has therefore not been included from the *RGDS*.

### NGPL

NGPL's 2012 Storage Optimization Project has been included in the *RGDS*.<sup>52</sup> This project involves incremental compression at an existing station in Iowa and a new compressor station in Illinois, as shown in Figure B14, along with abandonment of selected units at two other existing compressor stations.<sup>53</sup> NGPL will also reduce cushion gas inventory at a storage field in Texas by 5 Bcf and retain the cushion gas capacity for pipeline operational needs. The new compressor station will increase capacity of the Gulf Coast Mainline in Illinois by 100 MDth/d. The total cost of the facilities is expected to be \$57.5 million, as shown in Table B18. The project is currently under construction for a November 2014 in-service date.

<sup>50</sup> FERC Docket No. PF14-9

<sup>51</sup> Midwestern's Arsenal Road Project (FERC Docket No. CP14-26), which will be placed into service in Q2 2014, has not been included because it involves a pipe segment relocation to accommodate highway construction and will not create any incremental capacity.

<sup>52</sup> NGPL's Gulf Coast Market Expansion Project is included in Sensitivity #13 and summarized in Appendix C.

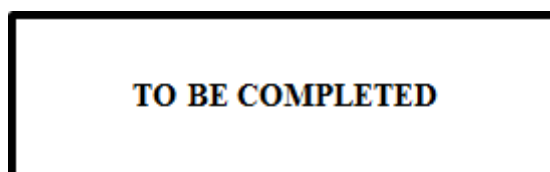
<sup>53</sup> FERC Docket No. CP11-547

**Figure B14. NGPL Expansion Project Facilities****Table B18. 2012 NGPL Storage Optimization Project Costs**

<b>Project Component</b>	<b>Cost</b>
Compression Station 205: 3,550 HP and modifications	\$12,338,821
Compressor Station 206A: New station, 22,000 HP	\$45,247,018

**Northern Natural**

Northern Natural's West Leg 2014 Project, which is designed to increase transportation capacity for market area customers, has been included in the *RGDS*.<sup>54</sup> The project facilities are illustrated in Figure B15. The facilities will provide for a total of 88.4 MDth/d of incremental winter peak day firm service, which has been contracted by CF Industries Nitrogen LLC, and industrial customer (88 MDth/d), and Interstate Power and Light, an LDC (0.4 MDth/d). The project facilities are currently under construction for a November 1, 2014 in-service date.

**Figure B15. Northern Natural Expansion Project Facilities****Table B19. West Leg 2014 Project Costs**

<b>Project Component</b>	<b>Cost</b>
Fremont Compressor Station: New station, 4,700 HP	\$18,015,126
Homer Compressor Station: New station, 9,480 HP	\$32,923,975
Pipelines: 1.17 miles of parallel 24" pipe	\$19,224,180
New meter station	\$ 717,121

**Rockies Express**

Rockies Express's Seneca Lateral Project has been included in the *RGDS*. This project involves the construction of a new 14.3-mile lateral connecting the Rockies Express mainline with a gas processing plant in Noble County, OH, and with a new 3,730 HP compressor station.<sup>55</sup> These facilities will be able to transport up to 250 MDth/d of natural gas into the Rockies Express

<sup>54</sup> FERC Docket No. CP13-528

<sup>55</sup> FERC Docket No CP13-539

mainline for redelivery in Ohio, Indiana and Illinois. The locations of the lateral and compressor station are shown in Figure B16. The estimated cost of constructing the project facilities is \$75 million. The project is currently under construction.

**Figure B16. Rockies Express Expansion Project Facilities**



### **Sabal Trail**

The new Sabal Trail pipeline has been included in the *RGDS*. This new pipeline, a joint venture between affiliates of Spectra Energy and NextEra Energy, will extend 460 miles from an interconnection with Transco in Tallapoosa County, AL to the new Central Florida Hub, as illustrated in Figure B17.<sup>56</sup> Project facilities include the lease of the capacity created by Transco's Hillabee Expansion Project, 460 miles of 36" mainline, 14 miles of 36" pipe to an interconnection with Florida Gas, and five new compressor stations. The project's 1,100 MDth/d capacity is scheduled to begin operation in phases: Phase 1 for 800 MDth/d in May 2017, Phase 2 for 200 MDth/d in May 2020 and Phase 3 for 100 MDth/d in May 2021. Sabal Trail is currently undergoing environmental review through the FERC pre-filing process.

**Figure B17. Sabal Trail Pipeline Facilities**



### **Southeast Supply Header**

The Southeast Supply Header's SESH Expansion Project has been included in the *RGDS*. This project will expand the capacity of the Southeast Supply Header mainline by 45 MDth/d based on a receipt point pressure commitment from Enable at an existing interconnection and the construction of a new compressor station.<sup>57</sup> Southern Company has executed a precedent agreement for 25 MDth/d of the project's capacity, and the remaining 20 MDth/d will be available for subscription under the tariff. The total project cost is estimated to be \$48 million, as shown in Table B20. The term of Southern Company's contract begins on September 1, 2015, and the new compressor station is expected to be in place by November 1, 2015.

<sup>56</sup> FERC Docket No. PF14-1

<sup>57</sup> FERC Docket No. CP14-87



**Table B20. SESH Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Pipeline: 4,000 feet of 20" pipeline connecting the compressor station	\$ 4,521,672
Dentville Compressor Station: New station, 8,000 HP	\$43,355,148

**Figure B18. Southeast Supply Header Expansion Project Facilities****Southern**

Southern's Zone 3 2016 Expansion Project has been included in the *RGDS*. This project will create 235 MDth/d of incremental capacity from Elba Express's interconnections with Transco to delivery points on Southern's pipeline system.

**Tennessee**

Six Tennessee expansion projects have been included in the *RGDS*: the Broad Run Expansion Project, the Broad Run Flexibility Project, the Connecticut Expansion Project, the Niagara Expansion Project, the Rose Lake Expansion Project and the Uniondale Expansion Project.<sup>58,59</sup> Known facilities associated with these projects are illustrated in Figure B19.

**Figure B19. Tennessee Expansion Project Facilities**

The Rose Lake Expansion Project will create 230 MDth/d of capacity on Tennessee's 300 Line from receipt points between Compressor Stations 321 and 313 to the Rose Lake interconnection with NFG and the Station 219 Pool.<sup>60</sup> The two project shippers are Statoil Natural Gas LLC (175 MDth/d) and South Jersey Resources Group LLC (55 MDth/d). The primary project facilities include installation of a 12,630-HP compressor unit at Station 315, and installation of a 12,661-HP compressor unit at Station 319, which will result in a net incremental capacity of 3,661 HP after the abandonment of two 4,500-HP units at the station. The total construction cost

<sup>58</sup> The Utica Backhaul Transportation Project, which created 500 MDth/d of north-to-south capacity on Tennessee, was placed into service on April 1, 2014.

<sup>59</sup> Tennessee's Northeast Energy Direct Project is included in Sensitivity #13 and summarized in Appendix C.

<sup>60</sup> FERC Docket No. CP13-3

associated with the project facilities is \$91.8 million, detailed in Table B21. The project facilities are currently under construction for a November 1, 2014 in-service date.

**Table B21. Rose Lake Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Compressor Station 315: 12,630 HP and modifications	\$38,642,399
Compressor Station 319: 12,661 HP and modifications, including abandonment of 9,000 HP	\$41,922,074
Compressor Station 317: Compressor unit replacement and other modifications	\$11,210,231

The Uniondale Expansion Project will enable Tennessee to provide 34 MDth/d of incremental firm transportation to UGI Penn Natural Gas, a Pennsylvania LDC, through facility modifications at Compressor Station 321 in Susquehanna County, PA.<sup>61</sup> The compressor modifications are estimated to cost \$8.5 million. The anticipated in-service date for the project is November 1, 2014.

The Niagara Expansion Project will enable Tennessee to provide 158 MDth/d of incremental firm transportation service to Seneca Resources Corporation for delivery at the Niagara interconnection with TransCanada.<sup>62</sup> This capacity will be created through construction of 3.1 miles of 30" loop line, modifications to existing compression and meter station facilities, and the lease of the Northern Access 2015 Project capacity from NFG. The total estimated cost of the project facilities is \$27.5 million. The project is currently under review by FERC with a target in-service date of November 1, 2015. The Environmental Assessment is scheduled to be issued in mid-July 2014.

The Broad Run Flexibility Project and the Broad Run Expansion Project will create 590 MDth/d and 200 MDth/d, respectively, of incremental firm transportation capacity from the Broad Run Lateral in Zone 3 to delivery points in Zone 1. The total cost of both projects' proposed facilities, which include three new compressor stations and modifications to existing compressor stations, is expected to be approximately \$782 million. Antero Resources has contracted for the full capacity of both projects. The in-service dates are staggered, with the Broad Run Flexibility Project beginning operating on November 1, 2015 and the Broad Run Expansion Project beginning operating on November 1, 2017.

The Connecticut Expansion Project will add 72 MDth/d of firm transportation capacity from Tennessee's interconnection with Iroquois at Wright to delivery points in Connecticut for a November 2016 in-service date.

<sup>61</sup> FERC Docket No. CP13-526

<sup>62</sup> FERC Docket No. CP14-88

## Texas Eastern

Four Texas Eastern projects have been included in the *RGDS*: the Gulf Market Expansion Project, the OPEN Project, the TEAM 2014 Project, the Union to Gas City Project.<sup>63,64</sup> Known facilities associated with these projects are illustrated in Figure B20.

**Figure B20. Texas Eastern Expansion Project Facilities**



The TEAM 2014 Project will create 600 MDth/d of incremental firm transportation capacity from receipt points in western Pennsylvania and West Virginia to delivery points in New Jersey, New York, Ohio, Mississippi and Louisiana.<sup>65</sup> 300 MDth/d will flow east to Lambertville, NJ and Staten Island, NY, 50 MDth/d will flow west to Lebanon, OH, and 250 MDth/d will flow south to Louisiana. Two producers, Chevron USA, Inc., and EQT Energy, LLC, have each contracted for 300 MDth/d of capacity, which will be created through loop line and incremental compression. The total estimated cost of the facilities, which is summarized in Table B22, is \$519.7 million. The project is currently under construction for a November 1, 2014 in-service date.

**Table B22. TEAM 2014 Project Costs**

<b>Project Component</b>	<b>Cost</b>
Holbrook Discharge Loop: 6.7 miles of 36" pipe	\$42,650,756
Bernville Discharge Loop: 5.6 miles of 36" pipe	\$44,546,418
Grantville Discharge Loop: 6.1 miles of 36" pipe	\$44,788,969
Perulack Discharge Loop: 8.1 miles of 36" pipe	\$49,072,066
Shermansdale Discharge Loop: 7.1 miles of 36" pipe	\$43,547,619
Armagh Compressor Station: 18,100 HP	\$56,994,115
Delmont Compressor Station: 52,000 HP (two units), abandonment of 25,100 HP	\$101,994,990
Entriiken Compressor Station: 26,000 HP	\$62,705,694
Uniontown Compressor Station: 6,100 HP of uprated compression (three units)	\$19,064,806
Other compressor station modifications	\$43,525,390
Other facility modifications: Launcher/receiver modifications, chromatograph installation	\$10,845,815

<sup>63</sup> The Bailey East Mine Panel L1 Project (FERC Docket No. CP14-9) and the Emerald Longwall Mine Panel D1 Project (CP14-4) have not been included because no capacity is created.

<sup>64</sup> Texas Eastern's Natrium Lateral and Renaissance Projects have been included in Sensitivity #13 and are summarized in Appendix C.

<sup>65</sup> FERC Docket No. CP13-84

The OPEN Project will enable Texas Eastern to provide 550 MDth/d from a new production lateral in Ohio to Louisiana, with 275 MDth/d each deliverable to the Egan Hub Storage facility and the Gillis Compressor Station.<sup>66</sup> Four producers have contracted for the full volume of the project: Chesapeake Energy Marketing, Inc. (350 MDth/d), CNX Gas Company LLC (50 MDth/d), Rice Drilling B LLC (50 MDth/d) and Total Gas & Power North America, Inc. (100 MDth/d). The total cost of the project facilities, which is listed in Table B23, is \$468,487,746. The project is currently being reviewed by FERC, and has a target in-service date of November 1, 2015.

**Table B23. OPEN Project Costs**

<b>Project Component</b>	<b>Cost</b>
Kensington Pipeline: 75.8 miles of 30" pipe	\$349,601,283
Colerain Compressor Station: New station, 18,800 HP	\$ 62,146,967
Other compressor station modifications	\$ 36,567,607
Three new meter stations	\$ 20,171,889

The Uniontown to Gas City Project will create 425 MDth/d of incremental firm transportation capacity from receipt points in southwestern Pennsylvania to an interconnection with Panhandle Eastern in Indiana.<sup>67</sup> Five producers have contracted for the full volume of the project: Range Resources-Appalachia, LLC, Rice Drilling B LLC, CNX Gas Company LLC, East Resources, Inc., and EQT Energy, LLC. The facility modifications required to permit bi-directional flow on this segment are relatively minor; the total estimated project cost is \$56.5 million. The project is currently under FERC review, and has a November 1, 2015 target in-service date.

The Gulf Market Expansion Project is designed to deliver up to 650 MDth/d of incremental supplies to the Gulf Coast region by continuing the conversion of the Texas Eastern mainline to bi-directional flow. Facility improvements include one new compressor station, incremental compression at an existing site modifications at seven other existing compressor stations. Five shippers have signed long-term service contracts: EQT Corporation (100 MDth/d), GDF Suez SA (200 MDth/d), Mitsubishi Corporation (100 MDth/d), MMGS, Inc. (100 MDth/d) and Range Resources-Appalachia LLC (150 MDth/d). The project is designed in two phases, with 250 MDth/d of capacity available in November 2016 and 400 MDth/d available in September 2017.

## **Texas Gas**

One Texas Gas project, the Ohio-Louisiana Access Project, has been included in the *RGDS*.<sup>68,69</sup> Texas Gas has received binding commitments for 625 MDth/d of expansion capacity to serve

<sup>66</sup> FERC Docket No. CP14-68

<sup>67</sup> FERC Docket No. CP14-104

<sup>68</sup> The Texas Gas Abandonment Project (FERC Docket No. CP13-485) has been previously listed among the projects included in the *Reference Gas Demand Scenario*, but has been removed following Texas Gas's withdrawal of the certificate application from the FERC review process due to insufficient market interest in the liquids pipeline that the abandoned segments were to be used for. Texas Gas's Bear Run Mine Relocation Project (FERC Docket No. CP12-481) has not been included because no capacity is created.

end-use markets, including LNG exports and power generators. Facilities have not been announced, but the capital cost of the project is estimated to be \$115 million, with facilities online in the first half of 2016.

### TransCanada

Two TransCanada projects have been included in the *RGDS*: the Energy East Expansion Project and the Parkway to Maple Project.<sup>70</sup>

TransCanada expects to file the Parkway to Maple Project with the NEB in 2014 to meet customer requests for new pipeline capacity to serve Eastern Canadian markets with a target in-service date of November 1, 2015.

The Energy East Expansion Project involves the conversion of one of TransCanada's 42" mainlines to oil transportation service. This conversion will remove approximately 1 Bcf/d of mainline capacity, with the remaining capacity varying from 5 Bcf/d at the western end of TransCanada's system to 1.9 Bcf/d across northern Ontario. Construction is expected to begin in 2016. The mainline segments impacted by the Energy East conversion are shown in Figure B21.

**Figure B21. TransCanada Energy East Pipeline Facilities**



### Transco

Eleven Transco projects have been included in the *RGDS*: the Atlantic Sunrise Project, the Dalton Expansion Project, the Gulf Trace Project, the Hillabee Expansion Project, the Leidy Southeast Project, the Mobile Bay South III Expansion Project, the Northeast Connector Project, the Rock Springs Expansion Project, the Rockaway Delivery Lateral Project, the Virginia Southside Expansion Project and the Woodbridge Delivery Lateral Project.<sup>71</sup> The known primary facilities associated with these projects are illustrated in Figure B22 through Figure B24.<sup>72</sup>

<sup>69</sup> Texas Gas's Northern Supply Access and Southern Indiana Market Lateral Projects are included in Sensitivity #13 and summarized in Appendix C.

<sup>70</sup> TransCanada's Eastern Triangle Expansion Project is included in Sensitivity #13 and summarized in Appendix C.

<sup>71</sup> The Brandywine Creek mainline "A" Replacement Project (CP12-497), which will allow internal inspection of a pipe segment in Pennsylvania and is expected to begin service in August 2014, has not been included in the *RGDS* because no capacity is created.

<sup>72</sup> Locations where the only facilities are modifications to allow bi-directional flow are not indicated on the maps.

Figure B22. Transco Expansion Project Facilities in NJ/NY

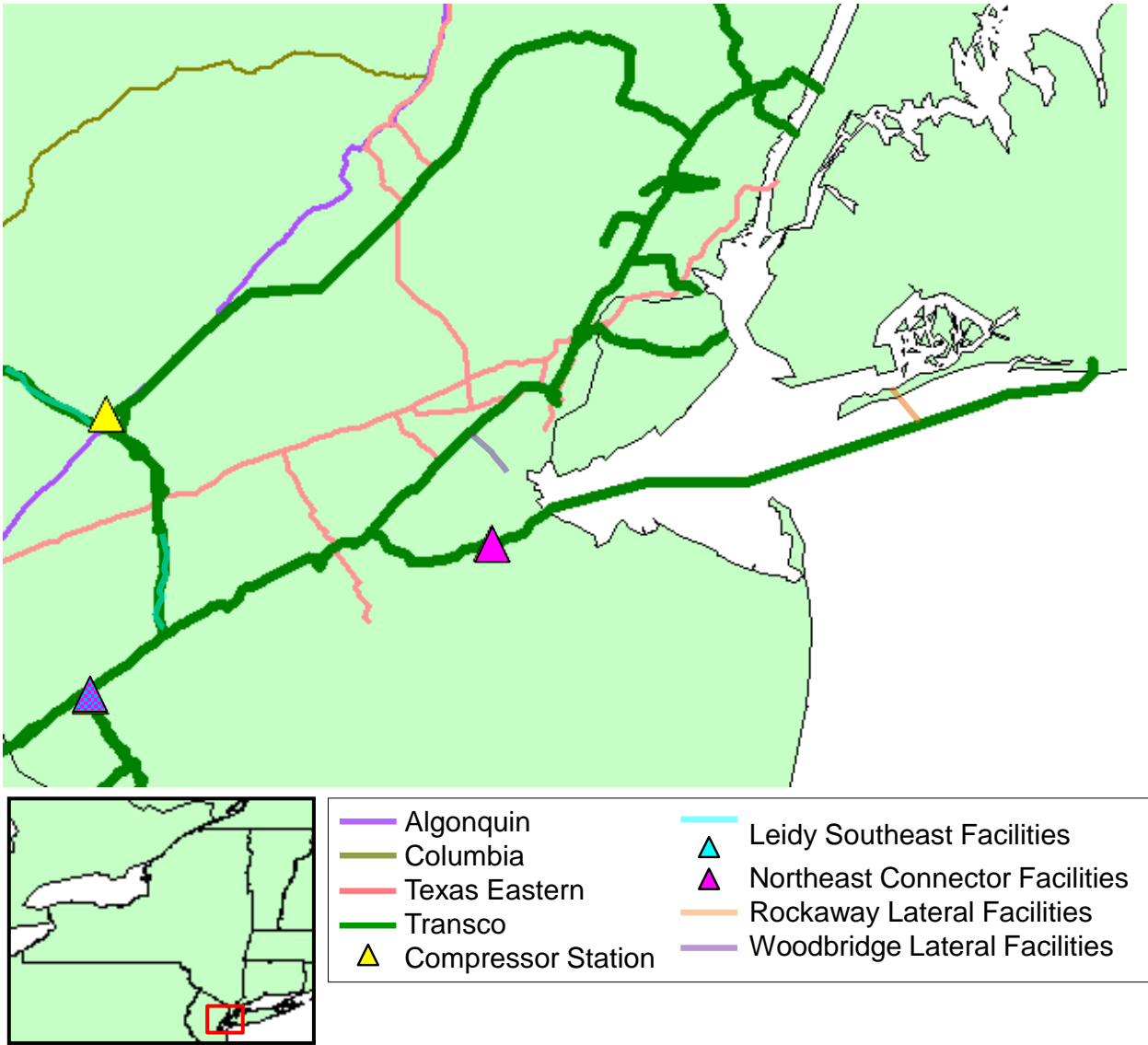


Figure B23. Transco Expansion Project Facilities in NJ/PA/MO/VA

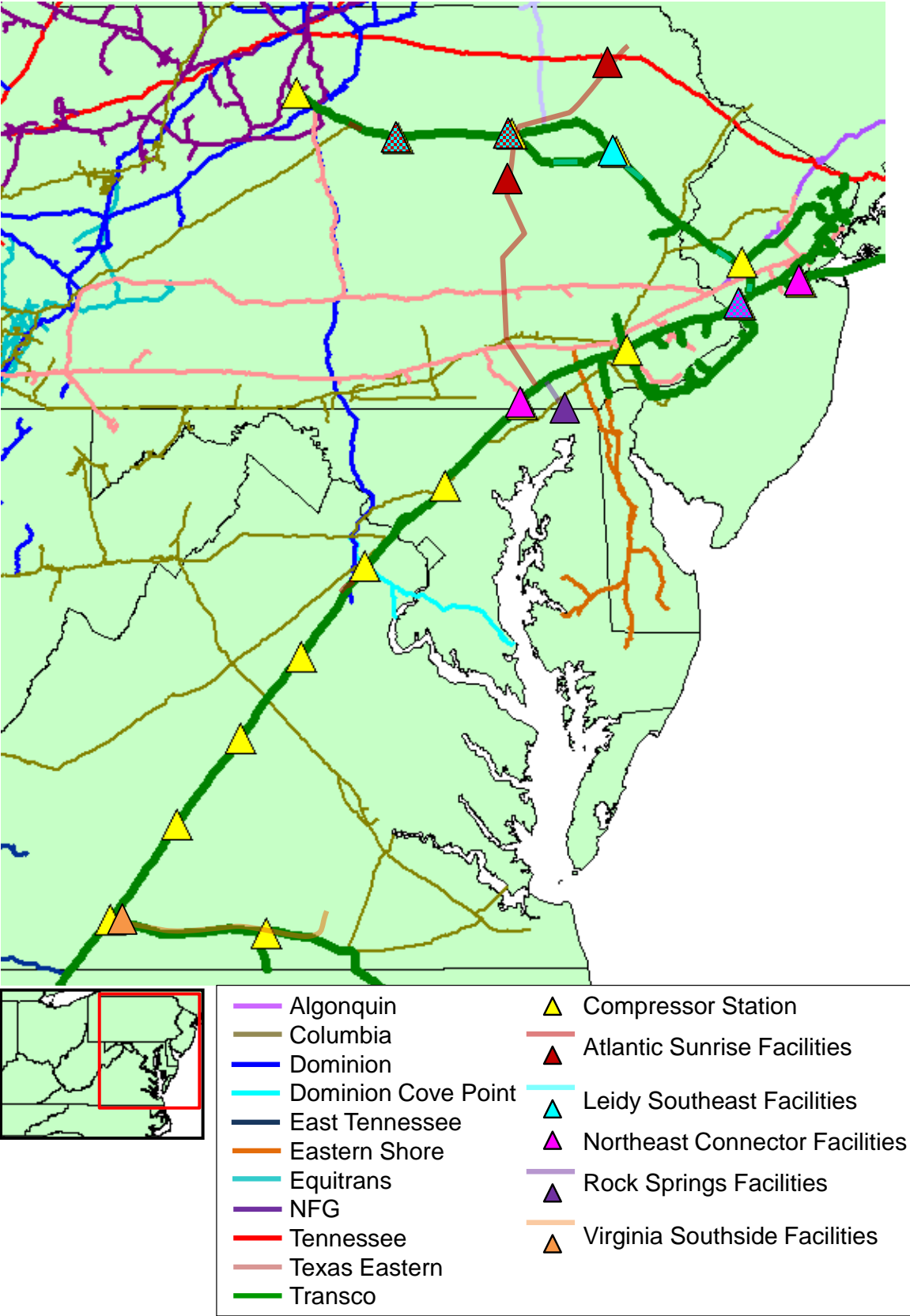
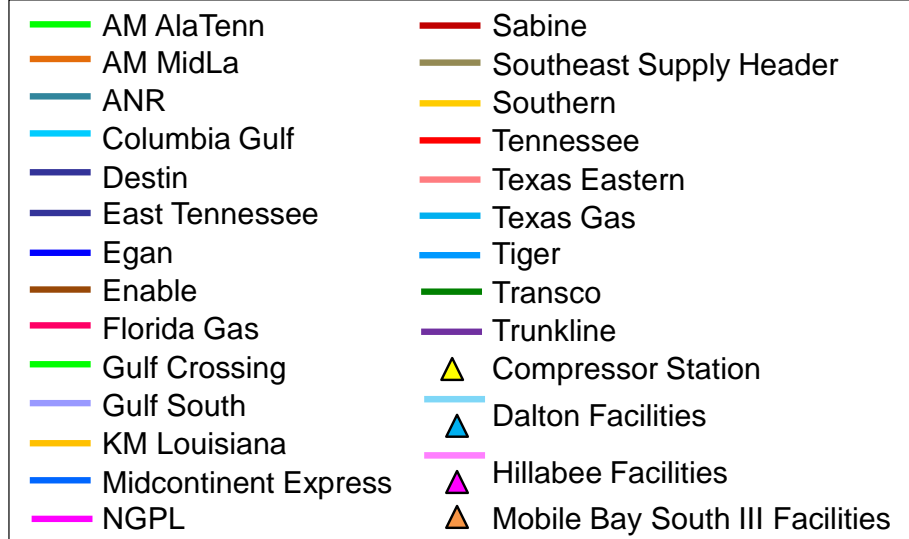
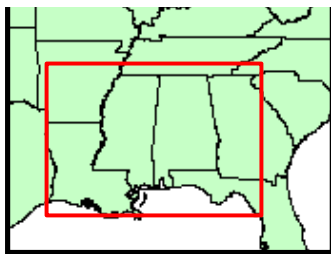
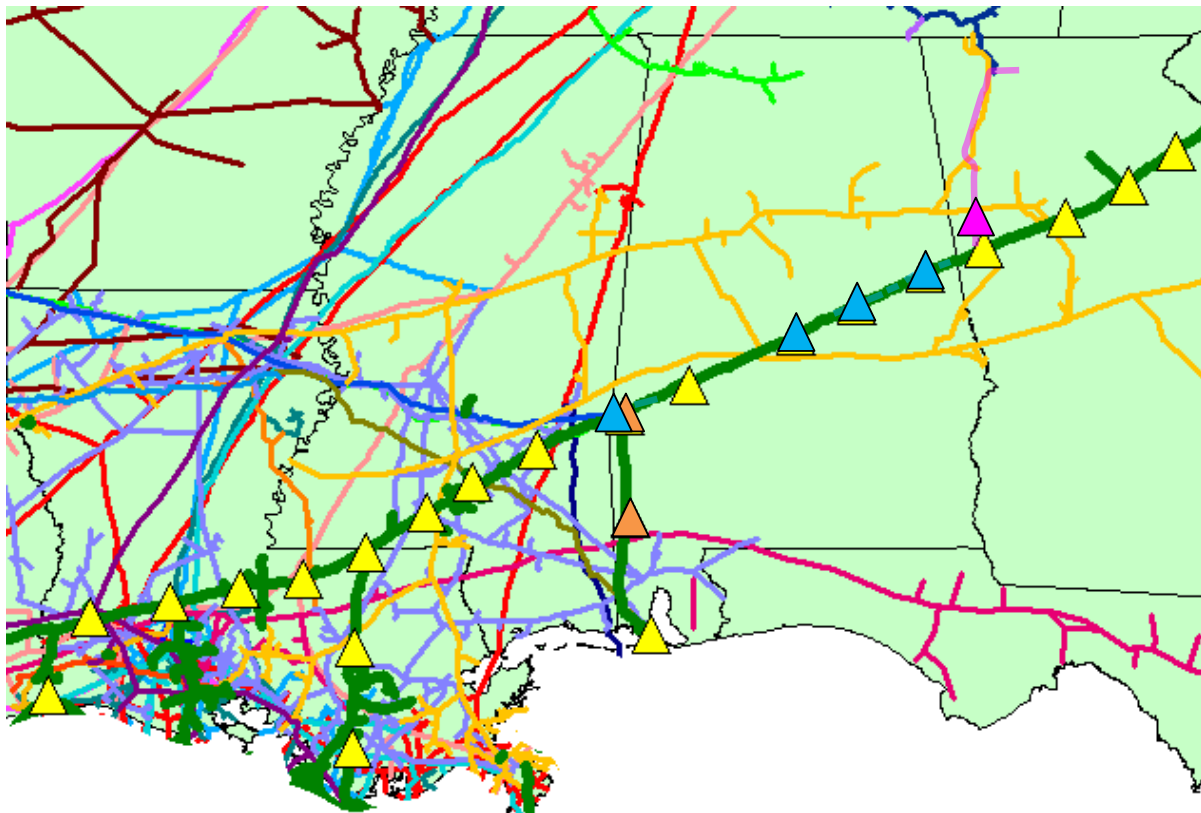


Figure B24. Transco Expansion Project Facilities in AL/GA



The Northeast Connector Project will create 100 MDth/d of incremental firm transportation capacity between Compressor Station 195 in York County, PA and the offtake point of the Rockaway Delivery Lateral, described below, from the Lower New York Bay Lateral that serves



Long Island.<sup>73</sup> The contracting shipper for the full volume of the project is National Grid. The incremental firm transportation service will be provided through the addition of compression at existing stations, as described in Table B24. The project facilities, which are estimated to cost \$48.5 million, are currently under construction for a November 1, 2014 in-service date.

**Table B24. Northeast Connector Project Costs**

<b>Project Component</b>	<b>Cost</b>
Compressor Station 195: Replacement of three existing gas-fired units with two electric drive units, resulting in an incremental 6,540 HP	\$43,360,814
Compressor Station 205: Uprates to two existing electric drive units, resulting in an incremental 5,000 HP	\$1,778,200
Compressor Station 207: Uprates to two existing electric drive units, resulting in an incremental 5,400 HP	\$3,330,995

The Rockaway Delivery Lateral Project involves construction of a new 3.2 mile lateral from a tap on Transco's Lower New York Bay Lateral to a new delivery point on Rockaway Peninsula in Queens County, NY.<sup>74</sup> The lateral will have a transportation capacity of 647 MDth/d, which is fully contracted by National Grid. This project does not involve any upstream capacity, the new lateral will be fed by National Grid's existing transportation entitlements to Long Island and the 100 MDth/d of incremental capacity created by the Northeast Connector Project. The total cost of the project is estimated to be \$182.8 million, as detailed in Table B25. The facilities are currently under construction for a November 1, 2014 in-service date.

**Table B25. Rockaway Delivery Lateral Project Costs**

<b>Project Component</b>	<b>Cost</b>
Offshore Lateral: 2.84 miles of 26" pipe	\$103,013,723
Onshore Lateral: 0.36 miles of 26" pipe	\$ 13,340,188
Meter Station	\$ 37,631,836
Hangar Rehabilitation: Meter station will be located inside an existing historic structure	\$ 28,814,254

The Woodbridge Delivery Lateral Project involves construction of a new 2.4-mile lateral from the Transco mainline to CPV Shore's Woodbridge Energy Center in Middlesex County, NJ.<sup>75</sup> The new lateral will be sized to transport up to 264 MDth/d and is estimated to cost \$32.3 million. The project will not create any incremental mainline firm transportation capacity. Transco has requested FERC approval to meet the project's April 1, 2015 target in-service date.

<sup>73</sup> FERC Docket No. CP13-132

<sup>74</sup> FERC Docket No. CP13-36

<sup>75</sup> FERC Docket No. CP14-18

**Table B26. Woodbridge Delivery Lateral Project Costs**

<b>Project Component</b>	<b>Cost</b>
Lateral: 2.4 miles of 20" pipe	\$28,741,076
Meter station	\$ 3,3454,525

The Mobile Bay South III Expansion Project will expand the southbound transportation capacity of Transco's Mobile Bay Lateral in Alabama.<sup>76</sup> The project facilities, including 20,500 HP of new compression at Compressor Station 85 and 1,000 HP of updated compression at Compressor Station 83, will create 225 MDth/d of incremental firm transportation capacity from interconnections with Gulf South and Midcontinent Express to interconnections with Florida Gas and the Bay Gas Storage facility. The total estimate cost is \$49.4 million. The project facilities are currently under construction and scheduled to begin operation in December 2014 (Compressor Station 83) and February 2015 (Compressor Station 85), prior to the April 1, 2015 target in-service date included in the certificate application.

The Virginia Southside Expansion Project will create 270 MDth/d of incremental firm transportation capacity from the Station 210 Pooling Point in Mercer County, NY to delivery points in southern Virginia and North Carolina.<sup>77</sup> Project facilities include a 91-mile loop along the existing South Virginia Lateral and a 7-mile lateral to serve Virginia Electric and Power Company's Brunswick County Power Station. The contracting shippers are Virginia Power Services Energy Corp., a marketing affiliate of Virginia Electric and Power (250 MDth/d), and Piedmont Natural Gas Company, an LDC (20 MDth/d).<sup>78</sup> The project facilities, listed in Table B27 are estimated to cost \$298.7 million. The project is currently under construction for a September 1, 2015 in-service date.

**Table B27. Virginia Southside Expansion Project Costs**

<b>Project Component</b>	<b>Cost</b>
Pipelines:98 miles of 24" pipe	\$234,927,920
Compressor Station 166: New station, 21,830 HP	\$ 48,061,435
Compressor Stations 190, 195 and 205: Modifications to enable bi-directional flow	\$ 8,704,205
Meter stations: One new and one modified	\$ 7,032,592

The Leidy Southeast Project will enable Transco to provide 525 MDth/d of incremental firm transportation service from Leidy Line receipt points, including the interconnection with CNYOG / Stagecoach to mainline delivery points as far south as Alabama.<sup>79</sup> Seven shippers have contracted for the full capacity of the project: Anadarko Energy Services Company (50

<sup>76</sup> FERC Docket No. CP13-523

<sup>77</sup> FERC Docket No. CP13-30

<sup>78</sup> Virginia Power Services Energy's contracted delivery points are the Brunswick County Power Station and the Cascade Creek interconnection with East Tennessee. Piedmont Natural Gas's delivery point is an existing meter station in North Carolina.

<sup>79</sup> FERC Docket No. CP13-551

MDth/d), Capitol Energy Ventures Corp. (20 MDth/d), MMGS Inc. (50 MDth/d), Piedmont Natural Gas Company, Inc. (100 MDth/d), Public Service Company of North Carolina Inc. (100 MDth/d), South Carolina Electric & Gas Company (40 MDth/d) and Washington Gas Light Company (165 MDth/d). Project facilities include both loop line and compression, as listed in Table B28. The total estimated project cost is \$607.3 million. The project is currently under review by FERC and has a target in-service date of December 1, 2015.

**Table B28. Leidy Southeast Project Costs**

<b>Project Component</b>	<b>Cost</b>
Dorrance Loop: 5.27 miles of 42" pipe	\$ 53,652,972
Franklin Loop: 11.47 miles of 42" pipe	\$137,845,527
Pleasant Run Loop: 6.92 miles of 42" pipe	\$ 82,086,751
Skillman Loop: 6.31 miles of 42" pipe	\$ 94,049,019
Compressor Station 520: 20,500 HP and modifications	\$ 48,686,803
Compressor Station 517: 33,400 net HP (one replacement unit, one new unit) and modifications	\$ 80,291,180
Compressor Station 515: 16,000 HP and modifications	\$ 48,754,510
Compressor Station 205: 2,000 HP (uprates to two units)	\$ 2,586,510
Related facility modifications	\$ 59,390,281

The Rock Springs Expansion Project will allow Transco to provide 192 MDth/d of firm transportation capacity from the Station 210 Pool in Mercer County, NJ to Old Dominion Electric Cooperative's Windcat Point Generating Facility in Cecil County, MD.<sup>80</sup> The project facilities described in the pre-filing letter include a 10.65 mile 20" lateral, a 4,000 HP compressor station, and other related modifications. The proposed in-service date is August 1, 2016.

The Gulf Trace Project is a 1,200 MDth/d expansion to serve the Cheniere Energy Partners Sabine Pass Liquefaction project and export terminal. The project involves modifications to enable bi-directional flow on the Transco mainline in Louisiana from Compressor Station 65 to Compressor Station 44, an 8-mile 36" lateral and two new compressor stations. The estimated cost of the project is approximately \$300 million, and the target in-service date is early 2017.

The Dalton Expansion Project will enable Transco to provide 448 MDth/d of incremental firm transportation from the Station 210 Pool in Mercer County, NJ to an interconnection with Gulf South in Pike County, MS and via a new 106-mile lateral to delivery points in Georgia.<sup>81</sup> Two shippers have contracted for the expansion capacity: Atlanta Gas Light (240 MDth/d) and Oglethorpe Smith (208 MDth/d).<sup>82</sup> Proposed facility modifications include a new 21,360 HP compressor station, 6.5 miles of 30" pipe, 4.7 miles of 24" pipe, 47.35 miles of 20" pipe, 5.23

<sup>80</sup> FERC Docket No. PF14-3

<sup>81</sup> FERC Docket No. PF14-10

<sup>82</sup> The location of the Oglethorpe Smith meter station appears to line up with the location of the Thomas A. Smith power plant in Murray County, GA, which is currently connected to East Tennessee.

miles of 16” pipe, three new meter stations and mainline modifications to accommodate bi-directional flow between New Jersey and Georgia. The target in-service date for the project is May 1, 2017.

The Hillabee Expansion Project will create approximately 1,132 MDth/d of incremental transportation capacity from Compressor Station 85 to a mainline tap in Tallapoosa County, AL for lease to Sabal Trail Transmission.<sup>83</sup> The project is expected to be completed in phases: 818 MDth/d in May 2017, 207 MDth/d in May 2020 and 107 MDth/d in May 2021. Proposed Phase 1 facilities include 16,000 HP of incremental compression at Station 95, 20,500 HP of incremental compression at Station 105, a new 32,000 HP compressor station (Station 84), 15.6 miles of 42” loop line, 4.6 miles of 48” loop line, three pipeline taps at the new interconnection, and other related modifications. Phase 2 facilities include 16,000 HP of incremental compression at Station 95, 3,500 HP of uprated compression at Station 100, 10.6 miles of 42” loop line and other related modifications. Phase 3 facilities include 12.8 miles of 42” loop line and other related modifications.

The Atlantic Sunrise Project will create 1,700 MDth/d of incremental firm transportation capacity along two paths from Pennsylvania to Alabama and Virginia.<sup>84</sup> The first path, which has eight contracted shippers, will create 850MDth/d of capacity from receipt points on the Leidy Line to Compressor Station 85 in Alabama. The second path, which has one contracted shipper, will create 850,000 MDth/d from a new receipt point north of the Leidy Line in Susquehanna County, PA to Transco’s Cascade Creek interconnection with Dominion Cove Point. Project facilities include 56.4 miles of 30” pipe from the new receipt point north of the Leidy Line to the Leidy Line, 122.2 miles of 42” pipe from the Leidy Line to Transco’s mainline in Lancaster County, PA, 5.5 miles of 36” loop line, 9.0 miles of 42” loop line, replacement of 2.5 miles of 30” pipe, a new 30,000 HP compressor station (Station 605), a new 40,000 HP compressor station (Station 610), 16,000 HP of incremental compression at Station 520, 16,000 HP of incremental compression at Station 517, 25,000 HP of incremental compression at Station 190, and other related facilities. The target in-service date for all facilities is July 1, 2017.

## Trunkline

Trunkline’s Mainline Abandonment Project has been included in the *RGDS*. This project involves the abandonment by sale of 770 miles of loopline for conversion to an oil pipeline, as illustrated in Figure B25.<sup>85</sup> Following abandonment, the certificated winter capacity of Trunkline’s mainline will be reduced by 597 MDth/d to 958 MDth/d. The cost of abandonment is estimated to be \$30.0 million. The project’s implementation plan calls for construction to begin on the oil pipeline in late August 2014.

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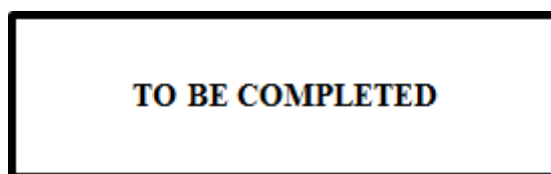
<sup>83</sup> FERC Docket No. 14-6.

<sup>84</sup> FERC Docket No. PF14-8

<sup>85</sup> FERC Docket No. CP12-491

**Figure B25. Trunkline Loopline to be Abandoned****Union**

Two Union projects have been included in the *RGDS*: the Parkway D and NPS 48 Brantford-Kirkwall Project and the Parkway West Project.<sup>86</sup> The facilities associated with these projects are illustrated in Figure B26.

**Figure B26. Union Expansion Projects**

The Parkway West Project involves the construction of a new compressor station and an additional connection the Enbridge system.<sup>87</sup> The Enbridge connection is expected to be in service in 2014, with the new compressor station following in 2015. Of the project's C\$203 million capital cost, C\$118 million is allocated to the Enbridge connection and C\$85 million to the new compressor station.

The Parkway D and NPS 48 Brantford-Kirkwall Looping Projects, scheduled to begin service in fall 2015, involve 44,500 HP of incremental compression at Parkway and 8.6 miles of 48" loopline between Dawn and Parkway.<sup>88</sup> Of the project's C\$204 million capital cost, C\$108 million is allocated to compression and C\$96 million to pipeline. The total incremental capacity associated with these projects is 433 TJ/d, or 410.4 MDth/d.

**WBI Energy**

WBI Energy's Garden Creek II Project has been included in the *RGDS*.<sup>89</sup> This project involves the construction of a new 15-mile 16" lateral that will transport up to 75 MDth/d from ONEOK Rockies Midstream, LLC's Garden Creek II gas processing plant to an interconnection with Northern Border, illustrated in Figure B27.<sup>90</sup> The lateral capacity will also be able to transport natural gas from other gas processing plants, including ONEOK's Garden Creek III processing

<sup>86</sup> Union's Dawn Parkway System Expansion (Parkway E), Hamilton-Milton and Lobo Compressor Station Expansion Projects are included in Sensitivity #13 and summarized in Appendix C.

<sup>87</sup> OEB Docket No. EB 2012-0433

<sup>88</sup> OEB Docket No. EB-2013-0074

<sup>89</sup> WBI Energy's Dakota Pipeline Project is included in Sensitivity #13 and summarized in Appendix C.

<sup>90</sup> FERC Docket No. CP14-50

plant, expected to be in service in early 2015. The lateral is estimated to cost \$13 million, and has a target in-service date of August 1, 2014.

**Figure B27. WBI Energy Expansion Project Facilities**

