

SOUTHERN INDIANA GAS AND ELECTRIC COMP

D/B/A

VECTREN ENERGY DELIVERY OF INDIANA, INC.

CAUSE NO. 45052

VERIFIED DIRECT TESTIMONY

OF

STEVEN A. HOOVER

DIRECTOR OF ENGINEERING

**SPONSORING PETITIONER'S EXHIBIT NO. 12,
ATTACHMENTS SAH-1 (CONFIDENTIAL) AND SAH-2 (CONFIDENTIAL)**

VERIFIED DIRECT TESTIMONY
OF
STEVEN A. HOOVER
DIRECTOR OF ENGINEERING

1 **Q. Please state your name and business address.**

2 A. My name is Steven A. Hoover. My address is One Vectren Square, Evansville, Indiana,
3 47708.

4 **Q. By whom are you employed and in what capacity?**

5 A. I am the Director of Engineering for Vectren Utility Holdings, Inc. ("VUHI"), the parent
6 company of Southern Indiana Gas and Electric Company d/b/a Vectren Energy Delivery
7 of Indiana, Inc. ("Vectren South", "Petitioner", or "the Company"), Indiana Gas Company,
8 Inc. d/b/a Vectren Energy Delivery of Indiana, Inc. and Vectren Energy Delivery of Ohio,
9 Inc.

10 **Q. Please describe your educational background.**

11 A. I received a Bachelor of Science degree in Mechanical Engineering Technology from the
12 University of Southern Indiana in 1990.

13 **Q. Please describe your professional experience.**

14 A. I began my career with Vectren South in 1993 as a plant engineer. Over the years, I
15 have held positions of increasing responsibility, including reliability engineer,
16 performance engineer, production coordinator, and engineering manager of gas
17 distribution engineering, southwest division. Prior to becoming director of gas and
18 electric engineering in July 2016, I was chief engineer of gas engineering.

1 **Q. What are your present duties?**

2 A. I have responsibility for gas and electric engineering and technical support for the utility
3 operations of all three VUHI utilities. My specific responsibilities include gas and electric
4 transmission and distribution engineering, gas and electric transmission project
5 management, gas and electric system planning, electric system asset management, and
6 geospatial systems.

7 **Q. Have you previously testified before the Indiana Utility Regulatory Commission**
8 **("Commission")?**

9 A. Yes. I have testified before the Commission on numerous occasions, most recently in
10 support of Vectren South's 7-year electric transmission, distribution, and storage system
11 improvement charge ("TDSIC") plan in Cause No. 44910, as well as in Cause No. 44910
12 TDSIC-1 and 2. I also provided testimony on behalf of Vectren South in Cause No.
13 44429 TDSIC-7 and Vectren North in Cause No. 44430 TDSIC-7 in support of capital
14 investments related to gas compliance and TDSIC projects. In addition, I provided
15 testimony on behalf of Vectren South and Vectren North in Cause No. 44894 in support
16 of the application for certificates of public convenience and necessity to provide natural
17 gas service to various areas in the joint applicants' territory.

18 **Q. Are you sponsoring any exhibits in support of your testimony?**

19 A. Yes. I am sponsoring the following exhibits:

Exhibit	Description
Petitioner's Exhibit 12, Attachment SAH-1 (Confidential)	A.B. Brown CCGT Proposed Pipeline Route
Petitioner's Exhibit 12, Attachment SAH -2 (Confidential)	A.B. Brown CCGT Pipeline Estimate

1 **Q. Were the exhibits identified above prepared or assembled by you or under your**
2 **direction or supervision?**

3 A. Yes.

4 **Q. What is the purpose of your Direct Testimony in this proceeding?**

5 A. My testimony will describe the cost estimate for the gas transmission line that Vectren
6 South will construct to connect its proposed combined cycle natural gas turbine
7 ("CCGT") generation facility to be located at its A.B. Brown Generating Facility in Posey,
8 County, Indiana with Texas Gas Transmission, LLC's ("TGT") interstate pipeline.

9 **Q. Please describe the gas transmission line Vectren South is proposing to**
10 **construct.**

11 A. Vectren South will need to install approximately twenty-three miles of twenty-inch gas
12 transmission pipeline to interconnect the proposed CCGT with TGT's existing interstate
13 pipeline system.

14 **Q. Why is Vectren South constructing the pipeline for the A.B. Brown CCGT?**

15 A. Vectren South (Gas), as the entity responsible for operating and maintaining existing
16 natural gas facilities and constructing any new natural gas infrastructure in the Vectren
17 South service area, is uniquely qualified and positioned to construct the new pipeline.
18 The Company has experience with both Federal and State requirements for construction
19 of interstate and intrastate natural gas pipelines as well as the ongoing maintenance of
20 pipelines in compliance with safety regulations. In addition, the Company's engineering
21 and construction teams have successfully completed similar projects including the
22 pipeline recently constructed to serve Indianapolis Power and Light's Eagle Valley
23 CCGT facility near Martinsville, IN.

1 **Q. Where will the Company interconnect with TGT's interstate pipeline?**

2 A. The proposed interconnection will be located at an existing TGT station east of Robards,
3 KY near the intersection of US 41 and Rockhouse Road. This site is at a location on the
4 TGT pipeline with sufficient available property to construct the interconnection facilities
5 and it also provides access to an existing TGT pipeline lateral corridor.

6 **Q. Has Vectren South developed a proposed route for the pipeline?**

7 A. Yes. Attached to my testimony as Petitioner's Exhibit 12, Attachment SAH-1
8 (Confidential) is a map showing a proposed route for the gas pipeline. This route is
9 currently best described as a proposed or preliminary route. As Vectren South begins
10 work to acquire easement and more closely evaluate the proposed route, adjustments
11 will be necessary. Such adjustments to the route are a routine part of pipeline planning.
12 Flexibility in pipeline route planning is important because it allows the Company to make
13 adjustments to avoid or minimize environmental or cultural impacts, accommodate
14 landowner concerns, or adjust for other issues not identified in the preliminary route
15 study.

16 **Q. Has Vectren South developed an estimate of the cost of the gas pipeline it will**
17 **construct to interconnect with TGT?**

18 A. Yes. The estimated cost to construct the gas pipeline is approximately \$87 million. This
19 estimate includes the cost for the Company's portion of the interconnection station with
20 TGT, the twenty-three mile pipeline, and the metering station at the A.B. Brown CCGT
21 plant. The detailed cost estimate is provided in Petitioner's Exhibit 12, Attachment SAH-
22 2 (Confidential).

23 **Q. What level of confidence does Vectren South have in this cost estimate?**

1 A. Vectren South completed a detailed estimate for the pipeline, interconnection station
2 with TGT, and meter station at A.B. Brown. For projects such as the A.B. Brown CCGT
3 pipeline, the Company develops the design and estimate in phases consistent with the
4 recommended practices of AACE International ("AACE"), formerly Association for the
5 Advancement of Cost Engineering International. AACE is an association dedicated to
6 furthering the concepts for total cost management and cost engineering. The
7 association is a recognized leader in the field of cost estimating and has published many
8 guides and recommended practices referenced and utilized by a variety of industries to
9 establish standardized criteria and ranges for project estimates.

10 Typically, a preliminary estimate is first developed using similar project historical
11 information, standard unit pricing, and table-top route and environmental review.
12 Depending upon the level of detail and effort, these estimates may have an accuracy
13 range of -30% to +50% of the estimated cost and correspond to the AACE Class 4
14 criteria.

15 To establish a higher level of accuracy for the A.B. Brown CCGT pipeline project
16 estimate, Vectren South advanced to a more detailed process using actual major
17 equipment and material pricing, a field route survey, construction contractor
18 engagement, and a preliminary environmental study. The estimate provided with this
19 testimony corresponds to an AACE Class 2 estimate with an expected accuracy range of
20 -20% to +20%. Project costs were also escalated for the proposed construction time
21 frame in 2021 and 2022.

22 **Q. Please describe the route and environmental study developed for the project**
23 **estimate.**

1 A. In 2016, Vectren South engaged EN Engineering (“ENE”) and Cardno Engineering
2 (“Cardno”) to assist with development of the project estimate and preliminary route and
3 environmental studies. ENE has partnered with Vectren South for years in the design of
4 gas distribution and transmission projects and Cardno has expertise in the area of
5 environmental management for large projects. Vectren South’s team provided the
6 project design criteria and worked with the contract engineering firms to develop a
7 preliminary route through analysis of geographical information system data, field
8 inspections and planning, review of property and environmental records, and
9 assessment of construction feasibility with a major gas transmission pipeline contractor.

10 **Q. Has the estimate been revised since the 2016 study?**

11 A. Yes. As additional details for both the gas supply plan and CCGT were defined, the
12 estimate was revised. Generally, these revisions consisted of updating material and
13 easement estimated costs.

14 **Q. Could the cost estimate be impacted by the steel and aluminum tariffs announced
15 by the Trump Administration?**

16 A. Yes, the cost estimate could be impacted by the steel and aluminum tariffs announced
17 by the Trump Administration, but that impact should be small. President Trump has
18 signed a proclamation imposing a 25% steel tariff or 10% aluminum tariff on imported
19 steel and aluminum; however, goods from trade partners such as Canada and Mexico
20 have already been excluded from the tariffs and other countries are seeking similar
21 exemptions. Typically, steel pipe for Vectren South’s transmission projects is sourced
22 from suppliers in the United States and Canada. Valves and other components are
23 generally imported from foreign suppliers or fabricated from steel imported from foreign
24 sources. Total pipe, valve, and other steel materials represent approximately 10% of the
25 total project cost and aluminum component cost is negligible. The proposed tariffs were

1 announced so closely to the time my testimony was pre-filed with the Commission that
2 insufficient details were available to credibly evaluate what impact those tariffs might
3 have on the Company's cost estimate. Vectren South will continue to evaluate the
4 implementation of the tariffs and update the Commission and others parties if the tariffs
5 materially impact the cost estimates.

6 **Q. Has Vectren South estimated how long it will require to construct the gas**
7 **pipeline?**

8 A. Yes. The duration of the project from initiating the formal pipeline route survey and
9 permitting to completion of construction is estimated to be just over three years. The
10 primary construction phase is anticipated to last approximately six to eight months.

11 **Q. When does Vectren South anticipate beginning construction of the gas pipeline?**

12 A. It is anticipated the pipeline will need to be available to transport gas to the new A.B.
13 Brown CCGT by the third quarter of 2022 for equipment commissioning and testing. To
14 meet this in service date, construction is planned to begin in August of 2021.

15 **I. Conclusion**

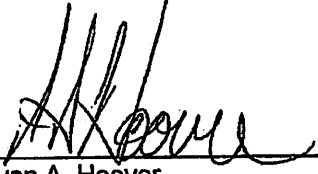
16 **Q. Does this conclude your prepared direct testimony?**

17 A. Yes, at this time.

18

VERIFICATION

The undersigned, Steven A. Hoover, affirms under the penalties of perjury that the answers in the foregoing Direct Testimony in Cause No. 45052 are true to the best of his knowledge, information and belief.



Steven A. Hoover

ATTACHMENT SAH-1

CONFIDENTIAL

Vectren AB Brown Power Plant Pipeline Estimate
20" Pipeline Option

Cause No. 45052
 Petitioner's Exhibit No. 12, Attachment SAH-2 (Public)

PROJECT Vectren AB Brown Power Plant Pipeline
 20" Pipeline
 945 psig Design Pressure
 23.3 miles (approx.)

LOCATION Henderson County Kentucky, to Posey County, Indiana
 DATE March 1, 2018

4.5 Years until preparation begins
 5.5 Years until construction begins

TYPE Budget Type Estimate

LINE NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
1	LEGAL					
2	Legal Fees	LOT	1			
3	Public Affairs Fees - Principal #1	HR	800			
4	Public Affairs Fees - Senior Consultant	HR	800			
5	Public Affairs Expenses - Printing, Travel, Etc.	LOT	1			
6	Legal and Public Affairs Subtotal					
7	Legal and Public Affairs Contingency	%	10.0%			
8	Cost Escalation Increase (Labor)	%	1.5%			1.5% Inflation for 4.5 years
9	TOTAL LEGAL COST					
10						
11	LAND					
12	Easements					
13	60-Ft Wide Permanent Easement	ACRE	170			60' Wide Permanent Easement
14	Valve Site Agreements	EACH	2			
15	TGT Purchase Point Site Agreement	ACRE	1			200' x 200' Site
16	Easement Recording fees	EACH	130			
17	Cathodic Protection Anode Beds	EACH	3			1 every 10 miles
18	Easement Costs Subtotal					
19	Temporary and Construction					
20	Temporary Workspace for Construction - Additional 40-Ft wide	ACRE	113			40' Wide Temporary Workspace, 20' on each side of the easement
21	Additional Temporary Workspace - All Crossings	ACRE	27			200'x200' for HDD entry/exit locations, 50'x100' all corners of crossings
22	Temporary Access Roads	ACRE	10			17 access roads, 17,180' total length, 25' wide
23	Contractor Yards	EACH	1			1 acre
24	Pipe Storage Yard	EACH	1			5 acres each
25	Temporary and Construction Subtotal					
26	Construction Damages					
27	Crop Damages/Trees - Permanent Easement	ACRE	153			90% of Permanent Easement
28	Crop Damages/Trees - Temporary Workspace	ACRE	102			90% of Temporary Workspace
29	Crop Damages/Trees - Additional Temporary Workspace	ACRE	24			90% of Additional Temporary Workspace
30	Construction Damages Construction Subtotal					
31	Permit Fees - Roads and Railroads					
32	Roads	EACH	25			
33	Railroads	EACH	2			
34	Survey Permits - Miscellaneous	EACH	47			2 per 1 mile
35	Permit Fees Subtotal					
36	Right-of Way Acquisition Labor					
37	ROW Management	MO	14			2 ROW Managers for 7 Months Each
38	Land Agent Labor - ROW Agent (inc mileage and per diem)	MO	4			1 Agent for 4 Months
39	Survey Permitting	MO	2			2 Agents for 1 Month Each
40	Survey Field Support	MO	6			1 Agent for 6 Months
41	Title Search	EACH	12			1 per 2 miles
42	Field Office	MO	7			1 Field Offices for 7 Months
43	Indirect Office Costs	EACH	1			1 ROW Office
44	Condemnation Costs including outside legal and witnesses	EACH	5			1 Condemnation per 5 miles
45	Pre-Construction, Construction Inspection, and Cleanup	EACH	9			1 Agent for 9 Months
46	ROW Acquisition Labor Subtotal					
47	Land Subtotal					
48	Land Contingency	%	10.0%			
49	Cost Escalation Increase (Non-Labor)	%	3.5%			3.5% Inflation for 4.5 years
50	Cost Escalation Increase (Labor)	%	1.5%			1.5% Inflation for 4.5 years
51	TOTAL LAND COST					
52						
53	ENVIRONMENTAL					
54	Surveys					
55	Desktop Review / Agency Consultation Letters	LOT	1			
56	Biological Resource Surveys (Wetlands / Streams / Sensitive Habitats)	DAY	4			
57	Cultural Resources Surveys	DAY	4			
58	Endangered Species Habitat Survey (Summer)	EACH	10			
59	Environmental Studies/Survey Subtotal					
60	Permits					
61	Pre-Permit Meetings with USACE, EPA, USFWS and DNR	STATE	2			
62	Joint USACE Section 10/404 Wetland Permit and State 401 Certification	STATE	2			
63	NPDES					
64	Storm water	STATE	2			
65	Hydrostatic test water - Discharge	STATE	2			
66	GIS Database Management	MILE	23.3			
67	Environmental Permits Subtotal					
68	FERC Permit					
69	Preparation of Resource Reports	LOT	1			
70	FERC Filing	LOT	1			
71	FERC Permit Subtotal					
72	Mitigation/Restoration					
73	Listed Species Mitigation	OCCURRENCE	6			
74	Wetland/Waters Mitigation	OCCURRENCE	12			
75	Mitigation/Restoration Subtotal					

Vectren AB Brown Power Plant Pipeline Estimate
20" Pipeline Option

Cause No. 45052
 Petitioner's Exhibit No. 12, Attachment SAH-2 (Public)

LINE NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
76	Construction					
77	Environmental Training	PER SPREAD	1			
78	Environmental Inspection	DAY	150			3 Inspectors
79	Construction Subtotal					
80	Post Construction					
81	Post-construction monitoring	OCCURRENCE	75			
82	ROW Restoration Monitoring	OCCURRENCE	150			
83	Post Construction Subtotal					
84	Project Management					
85	Project Management Subtotal	%	5%			
86	Environmental Subtotal					
87	Environmental Contingency	%	10.0%			
88	Cost Escalation Increase (Labor)	%	1.5%			1.5% Inflation for 4.5 years
89	TOTAL ENVIRONMENTAL COST					
90						
91	ENGINEERING SERVICES					
92	Project/Design Management	HR	500			
93	Field Engineer	HR	450			
94	Project Engineering	HR	2,500			
95	Electrical and Controls Engineering	HR	400			
96	Cathodic Protection Engineering (Includes field time and travel day rates)	HR	250			
97	Cathodic Protection Commissioning and Install Support (Includes day rate and travel)	DAY	3			
98	Construction Drafting w/ CADD Equipment	HR	4,000			
99	As-Built Drafting w/ CADD Equipment	HR	300			
100	Procurement	HR	150			
101	Metallurgical Consulting	HR	50			
102	Administrative Support	HR	50			
103	Geotechnical Surveys (Soil Borings at Major Directional Drills)	EACH	16			2 borings per HDD (8 HDDs anticipated)
104	Aerial Background & Aerial Mosaic Print Production	MILE	23.3			
105	Engineering Services Subtotal					
106	Engineering Contingency	%	10.0%			
107	Cost Escalation Increase (Labor)	%	1.5%			1.5% Inflation for 4.5 years
108	TOTAL ENGINEERING SERVICES COST					
109						
110	SURVEY SERVICES					
111	Preliminary/Cadastral Survey					
112	Project Manager	Hour	72			
113	Professional Land Surveyor	Hour	72			
114	Data Manager	Hour	96			
115	Party Chief	Hour	480			2 Party Chiefs - 4 weeks - 6 days per week - 10 hours per day
116	Instrument Operator	Hour	480			2 Instrument Operators - 4 weeks - 6 days per week - 10 hours per day
117	Rod Person	Hour	480			2 Rod Persons - 4 weeks - 6 days per week - 10 hours per day
118	Per Diem	Day	168			6 Personnel Per Diem - 4 weeks - 7 days per week
119	RTK GPS Unit	Day	48			2 RTK GPS Unit - 4 weeks - 6 days per week
120	Total Station	Day	48			2 Total Station - 4 weeks - 6 days per week
121	Pipe Locator	Day	48			2 Pipe Locator - 4 weeks - 6 days per week
122	Vehicle	Day	48			2 Vehicles - 4 weeks - 6 days per week
123	Project Mileage	Mile	4,800			2 Vehicles - 4 weeks - 6 days per week - 100 miles/day
124	Mobilization	LS	2			
125	Preliminary/Cadastral Survey Subtotal					
126	Certified Plat Development					
127	Professional Land Surveyor	Hour	130			130 Plats
128	Lead Mapper	Hour	260			130 Plats
129	Mapper	Hour	520			130 Plats
130	Certified Plat Development Subtotal					
131	Pre-Construction Staking					
132	Project Manager	Hour	36			
133	Data Manager	Hour	48			
134	Party Chief	Hour	240			2 Party Chiefs - 2 weeks - 6 days per week - 10 hours per day
135	Instrument Operator	Hour	240			2 Instrument Operators - 2 weeks - 6 days per week - 10 hours per day
136	Rod Person	Hour	240			2 Rod Persons - 2 weeks - 6 days per week - 10 hours per day
137	Per Diem	Day	84			6 Personnel Per Diem - 2 weeks - 7 days per week
138	RTK GPS Unit	Day	24			2 RTK GPS Unit - 2 weeks - 6 days per week
139	Total Station	Day	24			2 Total Station - 2 weeks - 6 days per week
140	Pipe Locator	Day	24			2 Pipe Locator - 2 weeks - 6 days per week
141	Vehicle	Day	24			2 Vehicles - 2 weeks - 6 days per week
142	Project Mileage	Mile	2,400			2 Vehicles - 2 weeks - 6 days per week - 100 miles/day
143	Mobilization	LS	2			
144	Pre-Construction Staking Subtotal					
145	As-Built/Construction Survey					
146	Project Manager	Hour	90			
147	Data Manager	Hour	120			
148	Party Chief	Hour	600			2 Party Chiefs - 5 weeks - 6 days per week - 10 hours per day
149	Instrument Operator	Hour	600			2 Instrument Operators - 5 weeks - 6 days per week - 10 hours per day
150	Rod Person	Hour	600			2 Rod Persons - 5 weeks - 6 days per week - 10 hours per day
151	Per Diem	Day	210			6 Personnel Per Diem - 5 weeks - 7 days per week
152	RTK GPS Unit	Day	60			2 RTK GPS Unit - 5 weeks - 6 days per week
153	Total Station	Day	60			2 Total Station - 5 weeks - 6 days per week
154	Pipe Locator	Day	60			2 Pipe Locator - 5 weeks - 6 days per week
155	Vehicle	Day	60			2 Vehicles - 5 weeks - 6 days per week

Vectren AB Brown Power Plant Pipeline Estimate
20" Pipeline Option

Cause No. 45052
Petitioner's Exhibit No. 12, Attachment SAH-2 (Public)

LINE NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
156	Project Mileage	Mile	6,000			2 Vehicles - 5 weeks - 6 days per week - 100 miles/day
157	Mobilization	LS	2			
158	As-Built/Construction Survey Subtotal					
159	Survey Services Subtotal					
160	Engineering and Preliminary Survey Contingency	%	10.0%			
161	Cost Escalation Increase (Labor)	%	1.5%			1.5% Inflation for 4.5 years
162	TOTAL SURVEY SERVICES COST					
163						
164	PROCUREMENT					
165	Pipeline Material					
166	20" x 0.312" 5LX60 HFW, PSL2 Pipe with FBE Coating	FOOT	118,691			Class 3 Pipe - Includes 3% Kicker
167	20" x 0.375" 5LX60 HFW, PSL2 Pipe with FBE Coating & ARO Coating	FOOT	1,205			Class 3 Pipe - Road, Railroad & Stream Bores, Includes 3% Kicker
168	20" x 0.375" 5LX60 HFW, PSL2 Pipe with FBE Coating & Powercrete Coating	FOOT	3,111			Class 3 Pipe - Road, Railroad & Stream HDD's, Includes 3% Kicker
169	20" x 0.500" 5LX65 HFW, PSL2 Pipe with FBE Coating & Powercrete Coating	FOOT	3,708			Class 3 Pipe - Ohio River HDD, Includes 3% Kicker
170	MLV Assembly - 8" x 0.322" Gr. B HFW, PSL2 Pipe with FBE Coating	FOOT	40			
171	MLV Assembly - 8" x 0.322" Gr. B HFW, PSL2 Pipe, Bare	FOOT	80			
172	20" Remote Control Valve at Mainline Valve Assembly, WE, ANSI 600	EACH	2			
173	MLV Assembly - 8" FE Plug Valve, ANSI 600	EACH	4			
174	MLV Assembly - 8" WN Flange, ANSI 600	EACH	8			
175	20" 5D 22.5" Segmentable Elbow, 0.312" W.T. 5LX60	EACH	8			
176	20" 5D 45" Segmentable Elbow, 0.312" W.T. 5LX60	EACH	239			Includes, pipeline route, foreign pipeline crossings, and all other crossings
177	20" 5D 90" Segmentable Elbow, 0.312" W.T. 5LX60	EACH	15			
178	MLV Assembly - 8" 45" L.R. Elbow, 0.322" W.T. Gr. B	EACH	4			
179	MLV Assembly - 8" Closure, ANSI 600	EACH	4			
180	MLV Assembly - 8" Tee, 0.322" W.T. Gr. B	EACH	4			
181	MLV Assembly - 20" x 8" Tee, 0.375" x 0.322" W.T. 5LX60	EACH	4			
182	MLV Assembly - Electrical Material	LS	1			
183	Marker Sign & Post	EACH	140			6 Per Mile
184	Cathodic Test Station & Foreign Line Bond Box	EACH	70			3 Per Mile
185	DC/Foreign Pipeline Crossing Test Stations	EACH	7			
186	AC Mitigation Decouplers	EACH	6			4 Per Mile
187	AC Mitigation Cable	FOOT	6,000			\$6 Per Foot for 6,000'
188	AC Coupon Test Station	EACH	2			
189	Rectifier/Groundbed	EACH	2			
190	Buoyancy control devices	LUMP	1			
191	Pipeline Material Subtotal					
192	Station Material					
193	TGT Station - 24" x 0.500" 5LX60 HFW, PSL2 Pipe, Bare	FOOT	20			
194	TGT Station - 20" x 0.375" 5LX60 HFW, PSL2 Pipe with FBE Coating	FOOT	40			
195	TGT Station - 20" x 0.375" 5LX60 HFW, PSL2 Pipe, Bare	FOOT	20			
196	TGT Station - 16" x 0.375" 5LX60 HFW, PSL2 Pipe with FBE Coating	FOOT	60			
197	TGT Station - 12" x 0.375" Gr. B HFW, PSL2 Pipe with FBE Coating	FOOT	120			
198	TGT Station - 12" x 0.375" Gr. B HFW, PSL2 Pipe, Bare	FOOT	40			
199	TGT Station - 8" x 0.322" Gr. B HFW, PSL2 Pipe with FBE Coating	FOOT	40			
200	TGT Station - 8" x 0.322" Gr. B HFW, PSL2 Pipe, Bare	FOOT	140			
201	TGT Station - 6" x 0.280" Gr. B HFW, PSL2 Pipe with FBE Coating	FOOT	60			
202	TGT Station - 6" x 0.280" Gr. B HFW, PSL2 Pipe, Bare	FOOT	20			
203	TGT Station - 2" x 0.218" Gr. B HFW, PSL2 Pipe, Bare	FOOT	20			
204	TGT Station - 20" WE x FE Ball Valve (pigging valve), ANSI 600	EACH	1			
205	TGT Station - 20" Remote Control Valve at Launcher, WE x FE, ANSI 600	EACH	1			
206	TGT Station - 12" WE Ball Valve, ANSI 600	EACH	1			
207	TGT Station - 12" FE Ball Valve, ANSI 600	EACH	5			
208	TGT Station - 10" WE Ball Valve, ANSI 600	EACH	1			
209	TGT Station - 8" FE Ball Valve, ANSI 600	EACH	6			
210	TGT Station - 6" WE Ball Valve, ANSI 600	EACH	1			
211	TGT Station - 6" FE Ball Valve, ANSI 600	EACH	1			
212	TGT Station - 4" FE Ball Valve, ANSI 600	EACH	1			
213	TGT Station - 2" WE x FE Ball Valve, ANSI 600	EACH	1			
214	TGT Station - 2" WE Ball Valve, ANSI 600	EACH	1			
215	TGT Station - 12" Plug Valve, ANSI 600	EACH	1			
216	TGT Station - 8" Plug Valve, ANSI 600	EACH	1			
217	TGT Station - 16" WN Flange, ANSI 600	EACH	2			
218	TGT Station - 12" WN Flange, ANSI 600	EACH	10			
219	TGT Station - 8" WN Flange, ANSI 600	EACH	35			
220	TGT Station - 6" WN Flange, ANSI 600	EACH	2			
221	TGT Station - 4" WN Flange, ANSI 600	EACH	1			
222	TGT Station - 8" Blind Flange, ANSI 600	EACH	1			
223	TGT Station - 4" Blind Flange, ANSI 600	EACH	1			
224	TGT Station - 2" Blind Flange, ANSI 600	EACH	1			
225	TGT Station - 20" 5D 45" Segmentable Elbow, 0.375" W.T. 5LX60	EACH	2			
226	TGT Station - 12" 90° L.R. Elbow, 0.375" W.T. Gr. B	EACH	14			
227	TGT Station - 8" 90° L.R. Elbow, 0.322" W.T. Gr. B	EACH	6			
228	TGT Station - 6" 90° L.R. Elbow, 0.280" W.T. Gr. B	EACH	1			
229	TGT Station - 4" 90° L.R. Elbow, 0.237" W.T. Gr. B	EACH	1			
230	TGT Station - 24" x 20" Eccentric Reducer, 0.500" x 0.375" W.T. 5LX60	EACH	1			
231	TGT Station - 20" x 12" Concentric Reducer, 0.375" W.T. 5LX60	EACH	3			
232	TGT Station - 12" x 10" Concentric Reducer, 0.375" x 0.365" W.T. Gr. B	EACH	1			
233	TGT Station - 24" x 6" x 4" Drawn Nozzle, 0.500" x 0.280" x 0.237" W.T. 5LX60	EACH	1			
234	TGT Station - 24" x 4" Drawn Nozzle, 0.500" x 0.237" W.T. 5LX60	EACH	1			
235	TGT Station - 20" x 8" Tee, 0.375" x 0.322" W.T. 5LX60	EACH	1			

Vectren AB Brown Power Plant Pipeline Estimate
20" Pipeline Option

Cause No. 45052
 Petitioner's Exhibit No. 12, Attachment SAH-2 (Public)

LINE NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
236	TGT Station - 12" Tee, 0.375" W.T. Gr. B	EACH	4			
237	TGT Station - 16" x 8" Tee, 0.375" x 0.322" W.T. 5LX60	EACH	6			
238	TGT Station - 12" x 6" Tee, 0.375" x 0.280" W.T. Gr. B	EACH	1			
239	TGT Station - 24" Closure, ANSI 600	EACH	1			
240	TGT Station - 8" Closure, ANSI 600	EACH	4			
241	TGT Station - 8" Cap ANSI 600	EACH	4			
242	TGT Station - 20" x 10" Hot Tap	EACH	1			
243	TGT Station - 12" x 6" Hot Tap	EACH	1			
244	TGT Station - 8" Ultrasonic Meter Tube Assembly (Ultrasonic Meter and Flow Conditioner)	EACH	2			
245	TGT Station - Filter Separator Assembly - 170 MMSCFD	EACH	1			
246	TGT Station - 10" Becker Flow Control Valve, FE, ANSI 600	EACH	1			
247	TGT Station - Gas Chromatograph, RTU, and Building	EACH	1			
248	TGT Station - Odorizer (8300 pumps, controller, 8000gal tank, containment, enclosure & skid)	EACH	1			
249	TGT Station - Electrical Material	LS	1			
250	AB Brown Station - 24" x 0.500" 5LX60 HFW, PSL2 Pipe, Bare	FOOT	20			
251	AB Brown Station - 20" x 0.375" 5LX60 HFW, PSL2 Pipe with FBE Coating	FOOT	40			
252	AB Brown Station - 20" x 0.375" 5LX60 HFW, PSL2 Pipe, Bare	FOOT	20			
253	AB Brown Station - 8" x 0.322" Gr. B HFW, PSL2 Pipe, Bare	FOOT	5			
254	AB Brown Station - 6" x 0.280" Gr. B HFW, PSL2 Pipe with FBE Coating	FOOT	60			
255	AB Brown Station - 6" x 0.280" Gr. B HFW, PSL2 Pipe, Bare	FOOT	20			
256	AB Brown Station - 2" x 0.218" Gr. B HFW, PSL2 Pipe, Bare	FOOT	20			
257	AB Brown Station - 20" WE x FE Ball Valve (pigging valve), ANSI 600	EACH	1			
258	AB Brown Station - 20" Remote Control Valve at Receiver, WE x FE, ANSI 600	EACH	1			
259	AB Brown Station - 8" FE Ball Valve, ANSI 600	EACH	1			
260	AB Brown Station - 6" FE Ball Valve, ANSI 600	EACH	1			
261	AB Brown Station - 4" FE Ball Valve, ANSI 600	EACH	2			
262	AB Brown Station - 2" WE x FE Ball Valve, ANSI 600	EACH	1			
263	AB Brown Station - 2" WE Ball Valve, ANSI 600	EACH	1			
264	AB Brown Station - 16" WN Flange, ANSI 600	EACH	2			
265	AB Brown Station - 8" WN Flange, ANSI 600	EACH	1			
266	AB Brown Station - 6" WN Flange, ANSI 600	EACH	2			
267	AB Brown Station - 4" WN Flange, ANSI 600	EACH	2			
268	AB Brown Station - 8" Blind Flange, ANSI 600	EACH	1			
269	AB Brown Station - 4" Blind Flange, ANSI 600	EACH	2			
270	AB Brown Station - 2" Blind Flange, ANSI 600	EACH	1			
271	AB Brown Station - 20" 5D 45" Segmentable Elbow, 0.375" W.T. 5LX60	EACH	2			
272	AB Brown Station - 6" 90° L.R. Elbow, 0.280" W.T. Gr. B	EACH	1			
273	AB Brown Station - 4" 90° L.R. Elbow, 0.237" W.T. Gr. B	EACH	2			
274	AB Brown Station - 24" x 20" Eccentric Reducer, 0.500" x 0.375" W.T. 5LX60	EACH	1			
275	AB Brown Station - 20" x 12" Concentric Reducer, 0.375" W.T. 5LX60	EACH	1			
276	AB Brown Station - 24" x 6" x 4" Drawn Nozzle, 0.500" x 0.280" x 0.237" W.T. 5LX60	EACH	1			
277	AB Brown Station - 24" x 4" Drawn Nozzle, 0.500" x 0.237" W.T. 5LX60	EACH	1			
278	AB Brown Station - 20" x 8" Tee, 0.375" x 0.322" W.T. 5LX60	EACH	1			
279	AB Brown Station - 12" x 6" Tee, 0.375" x 0.280" W.T. Gr. B	EACH	1			
280	AB Brown Station - 24" Closure, ANSI 600	EACH	1			
281	AB Brown Station - RTU and Building	EACH	1			
282	AB Brown Station - Electrical Material	LS	1			
283	Miscellaneous Materials	%	10.0%			
284	Station Material Subtotal					
285	Sales Tax	%	7.5%			
286	Material & Sales Tax Subtotal					
287	Freight					
288	Freight For All Non-Pipe Materials	LOT	4%			
289	Freight For All Class 3 Pipe	FOOT	127,600			
290	Freight Subtotal					
291	Material Inspection Services					
292	Pipe Mill	MAN-WEEK	10			2 Weeks - 5 Pipe Mill Inspectors
293	Coating Mill	MAN-WEEK	10			2 Weeks - 5 Coating Mill Inspectors
294	Valves, Hot Bends, Fittings, Etc.	MAN-WEEK	2			2 Man Weeks to Inspect Valves, Hot Bends, Fittings, Fabrications
295	Railroad Offload and Transport Pipe to Storage Yard	MAN-WEEK	1			1 Week - 1 Inspector
296	Material Inspection Services Subtotal					
297	Procurement Subtotal					
298	PO Loadings	%	4.5%			Vectren costs for Requisitioning and Purchasing
299	Procurement Contingency	%	15.0%			
300	Cost Escalation Increase (Non-Labor)	%	3.5%			3.5% Inflation for 4.5 years
301	Cost Escalation Increase (Labor)	%	1.5%			1.5% Inflation for 4.5 years
302	TOTAL PROCUREMENT COST					
303						
304	CONSTRUCTION					
305	Pipeline Installation Contractor					
306	RR Off Load & Transport 20" Pipe to Storage Yard	FOOT	122,828			Offload Rail Car & Load Truck, Transport, Offload Truck
307	Lay 20" x .312" X65 TRL Line Pipe Including Soil Sep., Coating Field Welds & All Tie-Ins	FOOT	121,658			Class 3 Location
308	Lay 20" x .375" X65 TRL Line Pipe Including Soil Sep., Coating Field Welds & All Tie-Ins	FOOT	1,170			Road Crossings
309	20" Directional Drill of AB Brown Railroad / Access Roads, approx. 450' of 20" x .375" X65 Pipe (Lump Sum)	LS	1			HDD
310	20" Directional Drill of Ohio River, approx. 3,600' of 20" x .500" X65 Pipe (Lump Sum)	LS	1			HDD
311	20" Directional Drill of Green Road Wetland, approx. 600' of 20" x .375" X65 Pipe (Lump Sum)	LS	1			HDD
312	20" Directional Drill of Pond Bayou, approx. 700' of 20" x .375" X65 Pipe (Lump Sum)	LS	1			HDD
313	20" Directional Drill of Highway 136 & Ditch, approx. 120' of 20" x .375" X65 Pipe (Lump Sum)	LS	1			HDD
314	20" Directional Drill of Pond Creek, approx. 550' of 20" x .375" X65 Pipe (Lump Sum)	LS	1			HDD
315	20" Directional Drill of Trigg Turner Road & Ditch, approx. 250' of 20" x .375" X65 Pipe (Lump Sum)	LS	1			HDD
316	20" Directional Drill of Canoe Creek, approx. 350' of 20" x .375" X65 Pipe (Lump Sum)	LS	1			HDD
317	20" Conventional Road and Railroad Bore (In Addition to Lay Price)	FOOT	1,170			

Vectren AB Brown Power Plant Pipeline Estimate
20" Pipeline Option

Cause No. 45052
 Petitioner's Exhibit No. 12, Attachment SAH-2 (Public)

LINE NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	COMMENTS
318	20" Water Body Open Cut Installation (In Addition to Lay Price)	FOOT	1,520			
319	Foreign Pipeline Crossings	EACH	7			
320	Provide X-Ray Services for Non-Destructive Inspection - 20"	MILE	23.3			
321	Hydrostatic Test 20" Pipe	FOOT	122,828			
322	Dry 20" Pipe to (-)38 Deg. F.	FOOT	122,828			
323	Furnish and Install Sandbag/Foam Trench Breaker	EACH	47			2 per Mile
324	Trench Box	EACH	2			
325	Supply and Install Wood Mats	EACH	4,653			200 Mats per Mile
326	Install and Remove Rock Construction Entrances	EACH	41			
327	Removing and Chipping of Trees and Brush	ACRE	14			
328	Field Tile Replacement	FOOT	300			
329	Supply and Install Saddle Bag Pipeline Weights on 20" Pipe	EACH	1,974			Installed @ 15' Intervals in Waterbody & Wetland Crossings
330	Installing Cathodic Test Stations and Foreign Line Bond Boxes	EACH	47			2 Per Mile
331	Installing DC/Foreign Pipeline Crossing Test Stations	EACH	10			
332	Installing Ground Bed/Rectifier Assembly	EACH	2			
333	Installing Pipeline Marker Signs	EACH	93			4 Per Mile
334	Supply and Installing Straw Bales	EACH	582			25 Bales Per Mile
335	Supply and Install Orange Safety Fence	FOOT	1,163			50' of Orange Safety Fence Per Mile
336	Supply and Install Silt Fence	FOOT	9,305			400' of Silt Fence Per Mile
337	Supply and Installing Erosion Control Fabric	SQ. YD.	582			25 Sq. Yd. Per Mile
338	Supply and Installing Geotextile Fabric Under Rock at Road Accesses	SQ. YD.	698			30 Sq. Yd. Per Mile
339	Supply and install Filter Bags for Dewatering	EACH	6			1 Per 4 Miles
340	Reseeding	ACRE	47			2 Acres Per Mile
341	Installing Anchored Mulch	ACRE	23			1 Acre Per Mile
342	Fabricate and Install 20" Mainline Valve Assembly	EACH	2			
343	Mainline Valve Assembly Electrical Installation	EACH	2			
344	Fabricate and Install 20" Receiver	EACH	1			
345	Install 8' X 8' RTU and Building	DAY	1			
346	AB Brown Electrical Installation	LS	1			
347	Pipeline Installation Contractors Subtotal					
348	Pipeline Construction Inspection Services					
349	Chief Inspector	MAN-WEEK	20			5 Months - 1 Inspector
350	Welding Inspector	MAN-WEEK	48			4 Months - 3 Inspectors
351	Utility Inspector	MAN-WEEK	64			4 Months - 4 Inspectors
352	Office Manager	MAN-WEEK	20			5 Months - 1 Manager
353	Construction Office Expenses - Office Rental	MO	5			5 Months
354	Construction Office Expenses - Office Supplies	MO	5			5 Months
355	Pipeline Construction Inspection Services Subtotal					
356	TGT Station Installation Contractor					
357	Mobilization and Demobilization	DAY	5			
358	Site Grading (Material, Labor, and Transportation)	LS	1			
359	Install New Driveway and Drainage Culvert	LS	1			
360	Excavation	DAY	3			
361	Form and Pour Concrete Foundations and Supports (Material and Labor)	DAY	5			
362	Line Tapping	DAY	4			
363	Install 6" and 10" Isolation Valves	DAY	3			
364	Install Filter Separator and 12" Bypass	DAY	3			
365	Install 8" Meter Runs, 8" Bypass, and 16" Headers	DAY	10			
366	Install 10" Control Valve, 12" Block Valves, and 12" Bypass	DAY	5			
367	Fabricate and Install 20" Launcher Assembly	LS	1			
368	Install Odorant Tank and Control Panel	DAY	3			
369	Install 25' X 15' Meter Building	DAY	1			
370	Install 8' X 8' RTU / Gas Chromatograph Building	DAY	1			
371	Non-Destructive Testing / Examination (X-Ray or Other)	DAY	5			
372	Hydrostatic Test Launcher and Other Piping	LS	1			
373	Pneumatic Test Station	LS	1			
374	Commissioning	DAY	5			
375	Site Gravel (Material, Labor, and Transportation)	LS	1			
376	Site Restoration	LS	1			
377	Electrical Installation	LS	1			
378	TGT Station Installation Contractors Subtotal					
379	TGT Station Construction Inspection Services					
380	Utility Inspection	MAN-WEEK	12			3 Months - 1 Inspector
381	Welding Inspection	MAN-WEEK	9			2.25 Months - 1 Inspector
382	TGT Station Construction Inspection Services Subtotal					
383	Construction Subtotal					
384	Construction Contingency	%	20.0%			
385	Cost Escalation Increase (Construction)	%	3.5%			3.5% Inflation for 5.5 years
386	TOTAL CONSTRUCTION COST					
387						
388	PROJECT MANAGEMENT					
389	Vectren					
390	Project Overhead	%	1.5%			Percentage provided by Vectren
391	Company Project Management Subtotal					
392	Project Management Contingency	%	10.0%			
393	Cost Escalation Increase (Labor)	%	1.5%			1.5% Inflation for 4.5 years
394	TOTAL PROJECT MANAGEMENT COST					
395						
396	OTHER					
397	Gas Purge & Pack	MSCF	16,212			
398	Cost Escalation Increase (Non-Labor)	%	1.5%			
399	AFUDC	%	0.50%			
400	TOTAL OTHER COST					
401						
402	TOTAL PROJECT COST					
403						
404	TOTAL COST PER MILE					
405	TOTAL COST PER FOOT					