PUBLIC VERSION

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BEFORE THE
SURFACE TRANSPORTATION BOARD

E.I. DUPONT DE NEMOURS & COMPANY Complainant v. NORFOLK SOUTHERN RAILWAY COMPANY Defendant	Docket No. NOR 42125

OPENING EVIDENCE AND ARGUMENT OF

E.I. DU PONT DE NEMOURS AND COMPANY

Volume III:
Stand-Alone Cost Evidence and
Witness Qualifications

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CASE GLOSSARY

AEP Texas 2006	*AEP Texas Northern Co v. BNSF Ry.,* STB Docket No. 41191 (Sub-No. 1) (served Nov. 8, 2006)
AEP Texas	*AEP Texas Northern Company v. BNSF Railway,* STB Docket No. 41191 (Sub-No. 1) (served Sept. 10, 2007)
AEPCO	*Arizona Electric Power Cooperative, Inc. v. BNSF Railway Company and Union Pacific Railroad Company,* STB Docket No. 42113 (served Nov. 22, 2011)
APS	*Arizona Pub. Serv. Co. and Pacificorp. v. The Atchison, T. and Santa Fe Ry.,* 2 S.T.B. 367 (1997)
Bottleneck Decision	*Central Power & Light Company v. Southern Pac. Transp. Co, et al.,* 1 STB 1059 (1996), aff'd sub nom. *MidAmerican Energy Company v. Surface Transportation Board,* 169 F.3d 1099 (8th Cir. 1999)
Coal Rate Guidelines or Guidelines	*Coal Rate Guidelines, Nationwide,* 1 I.C.C. 2d 520 (1985), aff'd sub nom. *Consolidated Rail Corp. v. United States*, 812 F.2d 1444 (3rd Cir. 1987)
Coal Trading Corp.	*Coal Trading Corp. v. The Baltimore & Ohio R.R., et al.,* 6 I.C.C. 2d 361 (1990)
Consolidated Papers	*Consol. Papers, Inc. v. Chi.& Nw. Transp., Inc.,* 7 I.C.C.2d 330 (1991)
CP&L	*Carolina Power & Light Co. v. Norfolk Southern Ry,* STB Docket No. 42072 (served Dec. 23, 2003)
DMIR I and II	*Minnesota Power, Inc. v. Duluth, Missabe & Iron Range Ry.,* 4 S.T.B. 64 (1998), on reconsideration, 4 S.T.B. 288 (1999)
Duke/CSXT	*Duke Energy Corp. v. CSX Transportation Inc.,* STB Docket No. 42070 (served Feb. 4, 2004)
Duke/NS	*Duke Energy Corp. v. Norfolk Southern Railway,* STB Docket No. 42069 (served Nov. 6, 2003)

CASE GLOSSARY

DuPont (Nitrobenzene)	*E.I. du Pont de Nemours and Company v. CSX Transportation, Inc.,* STB Docket No. 42101 (served June 30, 2008)
DuPont (Plastics)	*E.I. du Pont de Nemours and Company v. CSX Transportation, Inc.,* STB Docket No. 42099 (served June 30, 2008)
FMC	*FMC Wyo. Corp. v. Union Pacific Railroad Company,* 4 S.T.B. 699 (2000)
General Electric	*Gen. Elec. Co. v. Balt.& Ohio R.R.,* No. 38125S, 1984 ICC LEXIS 206 (ICC served Oct. 12, 1984)
General Procedures	*General Procedures for Presenting Evidence in Stand-Alone Cost Rate Cases,* STB Ex Parte No. 347 (Sub-No. 3) (served March 12, 2001).
IPA	*Intermountain Power Agency v. Union Pacific Railroad Company,* STB Docket No. 42127 (Public Version of UP Reply dated Nov. 10, 2011)
KCPL	*Kansas City P & L Co. v. Union Pac. R.R. Co.*, STB Docket No. 42095 (served May 19, 2008)
Major Issues	*Major Issues in Rail Rate Cases,* STB Ex Parte No. 657 (Sub-No. 1) (served Oct. 30, 2006)
Market Dominance Determinations	*Mkt. Dominance Determinations & Consideration of Prod. Competition*, 365 I.C.C. 118 (1981)
McCarty Farms	*McCarty Farms v. Burlington N., Inc.*, 3 I.C.C.2d 822 (1987)
Nevada Power II	*Bituminous Coal – Hiawatha, Utah to Moapa, Nevada,* 10 I.C.C.2d 259 (1994)
OG&E	*Oklahoma Gas & Electric Co., v. Union Pacific Railroad Company,* STB Docket No. 42111 (served July 24, 2009)
Otter Tail	*Otter Tail Power Co., v. BNSF Ry.,* STB Docket No. 42071 (served Jan. 27, 2006)

CASE GLOSSARY

PP&L	*PPL Montana, LLC v. The Burlington Northern and Santa Fe Ry. Co.*, 6 S.T.B. 286 (2002)
PSCo/Xcel	*Public Service Co. of Colorado d/b/a Xcel Energy v. Burlington Northern and Santa Fe Railway,* STB Docket No. 42057 (served June 8, 2004)
PSCo/Xcel II	*Public Service Co. of Colorado d/b/a Xcel Energy v. Burlington Northern and Santa Fe Railway,* STB Docket No. 42057 (served Jan. 19, 2005)
Special Procedures	*Special Procedures for Making Findings of Mkt. Dominance as Required by the R.R. Revitalization and Regulatory Reform Act of 1976,* 353 I.C.C. 874 (1976)
TMPA	*Texas Municipal Power Agency v. Burlington Northern and Santa Fe Railway,* 6 S.T.B. 573 (2003)
WFA/Basin	*Western Fuels Ass'n, Inc. and Basin Electric Power Coop. v. BNSF Railway,* STB Docket No. 42088 (served Sept. 10, 2007)
WFA/Basin II	*Western Fuels Ass'n, Inc. and Basin Electric Power Coop. v. BNSF Railway,* STB Docket No. 42088 (served Feb. 18, 2009)
Wisconsin P&L	*Wisconsin Power and Light Co., v. Union Pacific Railroad,* 5 S.T.B. 955 (2001)
West Texas Utilities	*West Texas Utilities Co. v. Burlington Northern Railroad,* 1 STB 638 (1996), aff'd sub nom. *Burlington Northern Railroad v. STB,* 114 F.3d 206 (D.C. Cir. 1997)

ACRONYMS

The following acronyms are used:

AAR	Association of American Railroads
AASHTO	American Association of State Highway Officials
AEI	Automatic Equipment Identification
AEO	EIA's Annual Energy Outlook Forecast
AHM	Anhydrous Methylamines
AII-LF	All-Inclusive Less Fuel Index, published by AAR
AQM	Aqueous Methylamines
AREMA	American Railway Engineering and Maintenance-of-Way Assoc.
ARRA	American Reinvestment and Recovery Act of 2009
ATC	Average Total Cost
ATF	Across-the-Fence
ATV	All-Terrain Vehicle
B&B	Bridge and Building
BNSF	Burlington Northern Santa Fe Railway Company
C&S	Communications and Signals
CAGR	Compound Annual Growth Rate
CFS	2007 Commodity Flow Survey
cmp	Corrugated Aluminized Metal Pipe
CMP	Constrained Market Pricing
CN	Canadian National Railway
CNW	Chicago & NorthWestern
COBRA	Consolidated Omnibus Budget Reconciliation Act
CPI	Consumer Price Index
CSXT	CSX Transportation, Inc.
CTC	Central Traffic Control
CWR	Continuous Welded Rail
CY	Cubic Yards
DCF	Discounted Cash Flow
DFE	Difluoroethane
DME	Dimethyl Ether
DMF	Dimethyl Formamide
DMS	Dimethyl Sulfate
DOT	U.S. Department of Transportation
DP	Distributed Power
DRR	DuPont Stand-Alone Railroad
DTL	Direct to Locomotive Fueling
EDI	Electronic Data Interchange
EEO	Equal Employment Opportunity
EIA	Energy Information Administration
EOTD	End of Train Device
FED	Failed-equipment Detector
FRA	Federal Railroad Administration
FSC	Fuel Surcharges

G&A	General and Administrative
GDP-IPD	Gross Domestic Product – Implicit Price Deflator
GWR	Gross Weight on Rail
HCl	Hydrochloric Acid (a/k/a Muriatic Acid)
HDF	On-Highway Diesel Fuel Index
HR	Human Resources
ICC	Interstate Commerce Commission
IDC	Interest During Construction
IDS/IPS	Intrusion Detection System/Intrusion Prevention System
ISS	Interline Settlement System
IT	Information Technology
KCS	Kansas City Southern Lines
LAN	Local Area Network
MACRS	Modified Accelerated Cost Recovery System
MIT	Massachusetts Institute of Technology
MGT	Million Gross Tons
MLO	Manager of Locomotive Operations
MMF	Monomethyl Formamide
MMM	Maximum Markup Methodology
MOW	Maintenance of Way
MTO	Manager of Train Operations
NCREIF	National Council of Real Estate Investment Fiduciaries
NDGPS	Nationwide Differential GPS
NPI	NCREIF Property Index
NS	Norfolk Southern Railway Company
NT/PC	Network Personal Computer
O/D	Origin/Destination
OS	Operating Station
OSHA	Occupational Safety and Health Administration
PDO	Bio-Propanediol
Pet Coke	Calcined Petroleum Coke
PPI	Producer Price Index
PTC	Positive Train Control
R/VC	Revenue to Variable Cost
RCAF-A	Rail Cost Adjustment Factor, adjusted for productivity
RCAF-U	Rail Cost Adjustment Factor, unadjusted for productivity
RMI	A GE Transportation Company
RMS	RMI's Revenue Management Services System
ROW	Right of Way
RSIA	Rail Safety Improvement Act of 2010
RTC	Rail Traffic Controller Model
SAC	Stand-Alone Cost
SARR	Stand-Alone Railroad
SEC	Securities Exchange Commission
SO3	Sulfur Trioxide
SPLC	Standard Point Location Code
STB	Surface Transportation Board

STCC	Standard Transportation Commodity Code
STEO	Short-Term Energy Outlook
T&E	Train and Engine
TCS	Triple Crown Services
TDIS	Thoroughbred Direct Intermodal Services
TiCl4	Titanium Tetrachloride
TiO2	Titanium Dioxide
TMS	RMI's Transportation Management Services System
TRN	NS Train Event Train Symbol
UP	Union Pacific Railroad
UPS	Uninterruptible Power Supply
URCS	Uniform Railroad Costing System
WAN	Wide Area Network
WFL	Waste, Flammable Liquid
WTI	West Texas Intermediate

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Part III-A

PUBLIC VERSION

BEFORE THE
SURFACE TRANSPORTATION BOARD

E. I. DUPONT DE NEMOURS AND COMPANY	)	
Complainant,	)	
v.	)	Docket No. 42125
NORFOLK SOUTHERN RAILWAY COMPANY	)	
Defendant.	)	

PART III

STAND-ALONE COST

A. STAND-ALONE TRAFFIC GROUP

The testimony in this Part is being sponsored by Thomas D. Crowley, Michael E. Lillis, Robert D. Mulholland and Sean D. Nolan, all of L.E. Peabody & Associates, Inc. Their credentials are detailed in Part IV and summarized herein.

For the last forty-one (41) years, Mr. Crowley has been analyzing and evaluating economic and transportation options available to users of all transportation modes, as well as the transporters of products. In addition to the railroads, pipelines and truck transporters, Mr. Crowley has assisted shippers of chemical traffic, coal and aggregate traffic, grain and agriculture traffic, lumber and raw material traffic analyze and evaluate different transportation options available to them in both competitive and captive environments in all parts of the United States. Mr. Crowley has sponsored economic evidence in every maximum rate proceeding based on the stand-alone cost test filed at the STB and its predecessor agency, the ICC, since the adoption of the 1985 *Guidelines.*

Mr. Lillis has more than twenty-five (25) years of experience solving economic, transportation and fuel supply problems for different shippers throughout the United States. He has performed extensive analyses in the area of stand-alone costing including traffic group identification, route layout, design and construction costs, revenue development, forecasting and the development of detailed operating plans for various stand-alone railroads.

Mr. Mulholland has over sixteen (16) years of experience conducting and directing studies, analyzing many different facets of the freight transportation industry, with an emphasis on economic and policy issues. He has worked in both the private and public sectors with or for shippers, carriers, facility operators, and regulators. Much of his work has focused on the operations, cost and pricing structures of the rail and trucking industries. He has developed and sponsored evidence regarding traffic selection, shipment routing, and traffic and revenue forecasts in several rate reasonableness proceedings before the STB.

Mr. Nolan has spent his twenty (20) year consulting career evaluating railroad cost of service, pricing and operations issues on behalf of shippers and government departments and agencies. The nature of his work has been supporting shippers in their procurement initiatives including the purchasing of fuel, transportation services, equipment and management of inventories. His development and analysis of alternative scenarios have been supported by tailored financial models used to estimate cost reductions and savings, actual versus budgeted variances, revenue to variable cost of service relationships, cash flows, and break-even and sensitivity analyses.

A more detailed description of each of the above witnesses' credentials is included in Part IV of this opening evidence.

The DRR is made up of 7,273 route miles. In addition, DRR will operate over 819 miles under trackage rights or joint facility agreements (as NS does today).[1] The DRR system includes route miles in twenty (20) states – Alabama, Delaware, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia and West Virginia. A schematic of the DRR system appears in Exhibit III-A-1.

The DRR stand-alone traffic group and associated revenues are discussed in the remainder of this Part III-A under following topical headings:

1. Stand-Alone Railroad Traffic
2. Re-routed Traffic
3. Volumes (Historical and Projected)
4. Revenues (Historical and Projected)

1. Stand-Alone Railroad Traffic

The DRR transports a broad range of commodities over its system, similar to what NS does over the same rail lines today. The DRR traffic group was developed using NS car and container waybill data and NS car and intermodal event data for the June 1, 2009 through December 31, 2010 time period, which were produced by NS in response to DuPont discovery requests.

As discussed in more detail in Part III-A-3 below, the waybill and car/intermodal event data was used in conjunction with several other files that were provided by NS in multiple disparate formats and with varying levels of common data fields that did not always enable efficient and/or complete database linking. The processes used to link the tables and difficulties encountered and overcome in developing those processes are detailed in Exhibit III-A-2.

[1] Total operating route miles = 8,101. *See* e-workpaper "DUPONT RR Route Miles Opening.xlsx" at level "DUPONT RR Miles".

Like NS, the DRR traffic includes chemical, intermodal, agricultural, coal, automotive, metals, paper, and construction materials shipments.[2] A detailed summary of the 2010 traffic group for the DRR is included in our workpapers.[3]

The DRR moves its shipments in the same manner that NS handles the traffic today on intermodal, unit, manifest (mixed general freight), and local trains. The DRR 2010 traffic is made up of { } agricultural products, { } metals, { } construction materials, { } paper, { } chemicals, { } automotive, { } coal, and { } intermodal on a carload or container basis. The 2010 carloads/containers and net tons associated with this traffic are shown in Table III-A-1 below.

Table III-A-1
Summary of DRR 2010 Carloads/Containers and Net Tons

Commodity (1)	2010 Traffic Data: Carloads/ Containers (2)	2010 Traffic Data: Net Tons (3)	Percent of Col (2) Total (4)
1. Agricultural Products (10)	{ }	{ }	{ }
2. Metals(20)	{ }	{ }	{ }
3. Construction Materials (25)	{ }	{ }	{ }
4. Paper (30)	{ }	{ }	{ }
5. Chemicals (40)	{ }	{ }	{ }
6. Automotive (60)	{ }	{ }	{ }
7. Coal (80)	{ }	{ }	{ }
8. Intermodal (IM)	{ }	{ }	{ }
9. Total	6,199,201	340,508,985	100.0%

Source: *See* e-workpapers "2010 IM.xlsx"; "2010 GEN Merch.xlsx"; "2010 COAL 80-Chem 40 – AUTO 60.xlsx"; and "2010 AG 10.xlsx".
NOTE: Numbers or letters in ( ) = NS commodity code

[2] The traffic and corresponding NS commodity code groupings include: Agriculture (10), Chemicals (40), Automotive (60), Coal (80), Intermodal (IM), and "General Merchandise" consisting of Metals (20), Construction (25), and Paper (30).

[3] *See* e-workpapers "2010 IM.xlsx"; "2010 GEN Merch.xlsx"; "2010 COAL 80-Chem 40 – AUTO 60.xlsx"; and "2010 AG 10.xlsx".

The DRR 2010 traffic consists of approximately 6.2 million carloads/containers or 340.5 million tons as shown in Table III-A-1 above.

2. Re-routed Traffic

As detailed further in Part III-C, the routing of certain trains moving on the DRR differs in part from the routing followed by the corresponding trains on NS rail lines. These re-routes are entirely internal to the DRR. That is, the operational change only affects the manner in which the trains move between the DRR on-junction and the DRR off-junction, and any trains that carry "cross-over" traffic are still interchanged with NS at a point along the actual route of movement. Board precedent permits such re-routes as long as they are reasonable, and do not adversely impact the quality of service that the customers in question otherwise would receive from NS.[4] The DRR re-routes meet these standards. The four (4) DRR segments over which trains will be re-routed are discussed below.

a. Bannon, OH to Kellysville, WV

NS has two alternative north-south routes in Ohio/West Virginia over which it moves trains between Bannon, OH and Kellysville, WV. One is via Chillicothe, OH and Kenova, WV, and the other is via Point Pleasant, WV and Belle, WV. The DRR will build only the eastern route via Point Pleasant, WV and Belle, WV and will move all selected through traffic, except intermodal and auto traffic, over the constructed segment. Intermodal and auto traffic will remain on the western route where NS moves it in the real world and will be interchanged to/from NS at Chillicothe, OH and Kellysville, WV. Because NS actually uses the chosen route (which is 0.3 miles shorter than the alternative[5]), and the RTC model results demonstrate that the "real world" service level is maintained, this DRR re-route is valid.

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[4] *See TMPA,* at 594-595; *AEP Texas* at 11.

[5] *See* e-workpaper "PERT_MILES.xls."

b. Altavista, VA to Riverton Jct.,VA

NS has two alternative north-south routes in Virginia over which it moves trains between Altavista, VA and Riverton Jct, VA. One is via Roanoke, VA and Waynesboro, VA, and the other is via Lynchburg, VA and Manassas, VA. The DRR will move all selected through traffic via Roanoke, VA and Waynesboro, VA. The chosen route is 8.3 miles longer[6] than the real-world alternative but the RTC model results demonstrate that the "real world" service level is maintained. Therefore, this DRR re-route is valid.

c. Roanoke, VA to Abilene Cross, VA

NS has two alternative east-west routes in Virginia over which it moves trains between Roanoke, VA and Abilene Cross, VA. One is via Lynchburg, VA and the other is via Altavista, VA. The DRR has no need for both routes, and will build only the southern route via Altavista, VA and will move all selected through traffic over the constructed segment to maximize DRR traffic density and minimize cost. Because NS actually uses the chosen route (which is 4.3 miles shorter than the alternative[7]), and the RTC model results demonstrate that the "real world" service level is maintained, this DRR re-route is valid.

d. Green, GA to Bremen, GA

NS has two alternative north-south routes in Georgia over which it moves trains between Green, GA and Bremen, GA. One is via Cedartown, GA and the other is via Austell, GA. The DRR will move unit coal train shipments destined for Wansley and Yates via Austell, GA. Although the chosen route is 38.1 miles longer[8] than the real-world alternative, the RTC model

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6 Id

7 Id

8 Id

results demonstrate that the actual historical service level is maintained, and this DRR re-route is valid.

As discussed in Part III-C-3, while some of the routes selected by the DRR are somewhat longer, all are reasonable under the *TMPA* and *AEP Texas* standards because:

a. The re-routes will not alter the operations of the residual NS, or require it to incur any additional costs;

b. The DRR will construct sufficient infrastructure on the constructed routes to maintain or increase operational efficiency and improve performance;

c. DuPont's RTC Model simulation of the DRR's operations shows average transit times for affected trains that are equal to or faster than those recorded by NS for 2010; and/or

d. In some cases, the route is shorter than the actual route and therefore presumed to be more efficient.[9]

3. Volumes (Historical and Projected)

The DRR begins operating on June 1, 2009. The DRR traffic group is composed of: (1) actual selected NS traffic (including issue traffic) moving from the start date through the end of 2010, and (2) forecasted traffic volumes over the January 1, 2011 through May 31, 2019 time period.

For all commodity groups (see Table III-A-1 above), the 2011 through 2015 DRR volumes were projected by adjusting the actual 2010 volumes using an annual volume change index developed from NS internal shipment forecasts provided in discovery. Specifically, NS produced the 2011-2015 internal forecasts it developed in December 2010. On a commodity-by-commodity group basis, DuPont aggregated the NS forecasted carload and container totals and developed year-over-year volume change indexes. DuPont then applied the annual volume change indexes it developed from the NS forecast data to the selected 2010 DRR movements

[9] *See Duke/NS* at 26 where the STB stated "If a rerouting shortens the distance, the Board will presume it is acceptable, unless the defendant railroad demonstrates otherwise."

based on the 2-digit "AR_MAJOR_COMMODITY_GRP" code provided in the NS waybill data. Aggregation of forecast data on a commodity-by-commodity group basis was necessary to maintain consistency between the traffic volume forecast and the train forecast because shipments that move together on a given train may be forecasted to grow at different rates in the NS forecast.

By developing commodity-by-commodity group-specific growth rates, DuPont was able to accurately reflect forecasted volume growth in the peak year train list. This aggregate approach is also consistent with the model accepted by the STB in *CP&L.*[10] In *CP&L*, the Board recognized that coal business in the east constantly shifts on an O/D pair basis and that an O/D pair-specific approach to forecasting the traffic group would be too restrictive and result in understated volume growth. The same holds true for this case.[11] Although some of the historical movements do not appear in the NS forecast (and would be excluded from the DRR volume forecast using an O/D specific approach), the forecast includes other comparable movements that are not included in the historical data. Therefore, including only the historical lanes would not be reflective of the actual system-wide growth NS projects.

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[10] *See CP&L* at 16-18.

[11] Although the issue in *CP&L* was limited to coal volume forecasting, the principles behind the Board's decision in that case are relevant to the forecast of coal and other commodities in this case, and DuPont applied the *CP&L* volume forecasting methodology to all selected movements in its forecast model. As stated by the STB in its December 23, 2003 *CP&L* decision, a customer may ship from one mine in one year, then shift to another the next year, and back to the first mine in the following year. Similarly, a customer may not ship from a SARR-served mine in the base year but it may do so in some or all subsequent years. Consequently, requiring exact origin-destination matches between forecasted traffic volumes and the selected base year is unduly restrictive and does not fairly reflect the traffic that would be available to the SARR in any given year. The better (and Board-endorsed) approach is to view the base year traffic group selected by the shipper as a snapshot that is reflective of the coal traffic that can reasonably be assumed to be available to the SARR for any given year of the model period. Thus, the fact that some traffic would not continue to move from a specific origin to a specific destination throughout the SAC analysis period does not mean that other traffic would not move from the mines served by the SARR. It is therefore reasonable to treat the base traffic group selected by the shipper as a representative traffic group for all modeled years. Theoretically there is no difference between coal and other commodities in this regard, so we have extended this Board approved logic to cover all existing carload movements on the SARR.

For the January 2016 through May 2019 time period, DRR volumes were determined by adjusting the prior year volume by the 2-digit commodity-specific[12] compound annual growth rate ("CAGR") developed utilizing 2 years of NS actual and 5 years of NS internal forecast data representing the 2009 to 2015 DRR time periods.[13] The average tons per car will remain the same throughout the study period.

Table III-A-2 below summarizes the year-over-year DRR growth rates by NS-designated commodity group.

Table III-A-2
DRR Traffic Growth Rates by NS Commodity Group

Time Period (1)	**Agriculture (Code 10)** (2)	**Chemicals (Code 40)** (3)	**Automotive (Code 60)** (4)	**Coal (Code 80)** (5)	**Other Freight (Code 20/25/30)** (6)	**Intermodal (Code IM)** (7)
1. 2010	XXX	XXX	XXX	XXX	XXX	XXX
2. 2011	{ }	{ }	{ }	{ }	{ }	{ }
3. 2012	{ }	{ }	{ }	{ }	{ }	{ }
4. 2013	{ }	{ }	{ }	{ }	{ }	{ }
5. 2014	{ }	{ }	{ }	{ }	{ }	{ }
6. 2015	{ }	{ }	{ }	{ }	{ }	{ }
7. 2016	{ }	{ }	{ }	{ }	{ }	{ }
8. 2017	{ }	{ }	{ }	{ }	{ }	{ }
9. 2018	{ }	{ }	{ }	{ }	{ }	{ }
10. 5/31/2019	{ }	{ }	{ }	{ }	{ }	{ }

Source: e-workpaper "DRR Traffic Revenue Forecast – OPEN.xlsx".

[12] The NS database code that reflects the 2-digit commodity is "AR_MAJOR_COMMODITY_GRP."

[13] *See AEPCO* at 23.

a. Merchandise Traffic

Merchandise (or "General Freight") traffic handled by the DRR was developed as described above. Some of the merchandise traffic originates and/or terminates on the DRR and some moves in overhead service. Table III-A-3 below summarizes the commodity groups, carloads, and tons moved in general freight service over the DRR in 2010.

Table III-A-3
Summary of DRR 2010 Merchandise Traffic

NS Major Commodity Group (1)	Carloads (2)	Net Tons (3)
1. Agriculture Products (10)	{ }	{ }
2. Metals (20)	{ }	{ }
3. Construction Materials (25)	{ }	{ }
4. Paper (30)	{ }	{ }
5. Chemicals (40)	{ }	{ }
6. Automotive (60)	{ }	{ }
7. Total	2,082,449	170,492,459

Source: *See* e-workpapers "2010 GEN Merch.xlsx"; "2010 COAL 80-Chem 40 – AUTO 60.xlsx"; and "2010 AG 10.xlsx".
Note: Numbers in ( ) = NS commodity code.

Merchandise carloads and tons handled by the DRR during each study year are shown in DuPont's workpapers. [14]

b. Intermodal Traffic

The intermodal traffic handled by the DRR is developed as described above. Some of the intermodal traffic is originated and/or terminated on the DRR system, and some moves in overhead service on the DRR. Table III-A-4 below summarizes the 2010 containers moved by the DRR in intermodal service by customer.

[14] *See* e-workpapers "2010 GEN Merch.xlsx"; "2010 COAL 80-Chem 40 – AUTO 60.xlsx"; and "2010 AG 10.xlsx".

Table III-A-4
Summary of DRR 2010 Intermodal Traffic

	Transporter (1)	Containers (2)
1.	JB Hunt Transport Inc.	{ }
2.	Triple Crown Services	{ }
3.	Hub Group Inc.	{ }
4.	United Parcel Service Inc.	{ }
5.	Hanjin Shipping Company Ltd.	{ }
6.	Maersk Inc.	{ }
7.	NYK International	{ }
8.	The Railbridge Corp.	{ }
9.	Hub Group	{ }
10.	Hapag-Lloyd America Inc.	{ }
11.	Alliance Shippers Inc.	{ }
12.	OOCL USA Inc.	{ }
13.	Rail Bridge	{ }
14.	Interdom Partners Ltd.	{ }
15.	Cosco North America Inc.	{ }
16.	TDIS	{ }
17.	All Other	{ }
18.	Total Intermodal Traffic	2,929,465

Source: *See* e-workpaper "2010 IM.xlsx."

Intermodal containers handled by the DRR for each year of the DCF model are shown in DuPont's workpapers.[15]

c. Coal Traffic

The coal traffic handled by the DRR is developed as described above. The DRR will serve 23 origin coal mines directly and will receive trainloads of coal in interchange from NS and other railroads. Coal moving over the DRR terminates at generating stations and industrial facilities located on the DRR system and will be interchanged (interline forwarded) with NS and other railroads that will transport this traffic to electric utilities, marine coal terminals or industrial facilities located off the DRR system.

Electric utility coal volume growth was capped at an 85 percent plant capacity level at identified generating stations consistent with prior STB decisions in rate reasonableness

[15] *See* e-workpaper "2010 IM.xlsx."

proceedings involving the forecasted growth of coal to electric utilities. Because capping the amount of traffic to individual generating stations results in overall DRR coal volumes below the level that would result from universal application of the aggregate growth factor implicit in the NS coal volume forecast (adjusted by the annual growth factors described above), DuPont recalibrated the growth factor for non-capped generating stations to accommodate the give-and-take needed to retain the overall NS growth projections. For example, assume a SARR serves two coal customers and each shipped 1 million tons in the base year (2 million tons in total). Also assume an aggregate forecast growth rate of 10 percent in year two, or 1.1 million tons to each generating station for a total of 2.2 million tons. Now assume one plant is capped at 1.05 million tons based on the 85 percent capacity factor limitation. The foregone growth from the limited generating station would be moved to the generating station with no capacity limit. In effect, one generating station would be receiving 1.05 million tons and the other 1.15 million tons resulting in the retention of the original aggregate 10 percent growth projection.[16]

DuPont's workpapers[17] show the on and off system coal destinations and total tons of coal handled by the DRR for each year of the DCF model.

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[16] *See AEPCO* at 21.

[17] *See* e-workpapers "2010 IM.xlsx"; "2010 GEN Merch.xlsx"; "2010 COAL 80-Chem 40 – AUTO 60.xlsx"; and "2010 AG 10.xlsx".

d. Peak Year Traffic

The peak traffic year for the DRR will be June 1, 2018 through May 31, 2019, the final year of the ten year SAC analysis period. A summary of the peak year traffic is shown in Table III-A-5 below.

Table III-A-5
Summary of DRR Peak Year Traffic –June 2018- May 2019

Traffic Type (1)	Carloads/ Containers (2)	Tons (3)	Percent of Col (2) Total (4)
1. General Freight	{ }	{ }	{ }
2. Coal	{ }	{ }	{ }
3. Intermodal	{ }	{ }	{ }
4. Total	9,778,343	492,609,078	100.0%

Source: e-workpaper "III-A-Table.xlsx."

4. Revenues (Historical and Projected)

DuPont developed total movement revenue for each selected movement using the revenue and revenue adjustment data provided by NS in discovery for the June 1, 2009 through December 31, 2010 time period. DuPont then forecasted the movement revenues for each year of the SAC analysis period based on the methodology below. DuPont allocated the movement revenues between the DRR and residual NS using the Board's modified average total cost ("ATC") methodology. A description of the general process DuPont used to develop movement revenues (including forecasted revenues) by traffic type is outlined below and followed by a discussion of the development of DRR revenue for each movement.

Calculating base net revenues was a difficult and cumbersome process. The difficulty arose from the nature and scope of the waybill revenue data and the revenue adjustment data provided by NS in discovery. Specifically, NS provided revenue data in an inconsistent manner in the waybill file, in multiple files, and in multiple different media types containing multiple record layouts and few common data fields that would enable efficient and precise linking of files. Exhibit III-A-2 contains a detailed description of the problems encountered and solutions developed to process and utilize the complex, disparate, and extremely voluminous data NS provided in an orderly, automated, repeatable way. There is no doubt that our automated model was unable to make positive links between and among the many data tables for some shipments. These broken links are due entirely to data deficiencies and were unavoidable in the development of our system of straightforward, intuitive, and understandable scripts and models to pull all the disparate data sources together in a way that facilitated the SAC analysis.

a. Historical Revenues

DuPont developed movement revenues, (which included fuel surcharges, absorbed switching charges, other revenue claims and handling/haulage settlement payments) for each unique shipment[18] handled by the DRR. A unique shipment is defined by Origin/Destination ("O/D") pair, commodity group, and contract, if available. Using this data, NS movement revenues were developed as follows:

1. For merchandise, coal and non-TCS/TDIS[19] intermodal moves, the following fields were summed:[20]
    a. Line Haul Revenues
    b. Fuel Surcharge Revenues
    c. Accounts Receivable Adjustments
    d. Other NS Revenue Adjustments
    e. Contract Refunds
    f. Dumping Amounts
    g. Net Switching Payments (where applicable)[21]

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[18] A shipment is defined as a car/container or group of cars/containers moving under the same waybill.

[19] NS classifies intermodal shipments the following three ways: 1) intermodal; 2) TCS= Triple Crown Services; and 3) TDIS= Thoroughbred Direct Intermodal Services.

[20] All revenue fields were summed because negative revenue adjustments were captured as negative values in the data processing models. For example, contract refunds are recorded as negative amounts.

[21] Switching charges/payments were provided in separate data tables and often could not be positively linked to the waybill data based on the common fields provided. To the extent that links could be made, switching charges were considered in the development of NS movement revenues.

h. Net Handling Line Payments (where applicable)[22]
i. Net Haulage Receivable Payments (where applicable)[23]

2. For TDIS Intermodal moves, the following fields were summed:
   a. TDIS Net Revenues (total revenues less drayage expenses)
   b. Fuel Surcharge Revenues
   c. Accounts Receivable Adjustments
   d. Other NS Revenue Adjustments
   e. Contract Refunds
   f. Dumping Amounts
   g. Net Switching Payments (where applicable)
   h. Net Handling Line Payments (where applicable)
   i. Net Haulage Receivables Payments (where applicable)

3. For TCS Intermodal moves, the following fields were summed:
   j. TCS Net Revenues (total revenues less drayage expenses)
   k. Fuel Surcharge Revenues
   l. Accounts Receivable Adjustments
   m. Other NS Revenue Adjustments
   n. Contract Refunds
   o. Dumping Amounts
   p. Net Switching Payments (where applicable)
   q. Net Handling Line Payments (where applicable)
   r. Net Haulage Receivables Payments (where applicable)

b. <u>Projected Revenues</u>

DRR revenue forecasts for 2011-2019 were developed using: (1) NS 2010 traffic and revenue data; (2) NS pricing authorities; (3) NS internal revenue forecasts; and (4) publicly available forecasts of key economic indices.

Table III-A-6 summarizes the revenue forecast procedures that DuPont used during the study time period.

[22] Handling Line charges/payments were provided in separate data tables and often could not be linked to the waybill data based on the common fields provided. To the extent that links could be made, handling line charges were considered in the development of NS movement revenues.

[23] Haulage receivable payments were provided in separate data tables and often could not be linked to the waybill data based on the common fields provided. To the extent that links could be made, haulage receivables payments were considered in the development of NS movement revenues.

Table III-A-6
Summary of Revenue Forecast Procedures

NS Major Commodity Group (1)	Study Period 2011-2015 (2)	Study Period 2016-5/31/19 (3)
Revenue Less Fuel Surcharge		
1. Agriculture (10)	NS Internal Forecasts	All-LF [1/]
2. Metals (20)	NS Internal Forecasts	All-LF [1/]
3. Construction (25)	NS Internal Forecasts	All-LF [1/]
4. Paper (30)	NS Internal Forecasts	All-LF [1/]
5. Chemicals (40)	NS Internal Forecasts	All-LF [1/]
6. Automotive (60)	NS Internal Forecasts	RCAFU [1/]
7. Coal (80)	NS Internal Forecasts	AEO East Escalator [2/]
8. Intermodal (IM)	NS Internal Forecasts	All-LF [1/]
Fuel Surcharges ("FSC")		
9. All Commodity Groups	NS WTI FCS Program [3/]	NS WTI FSC Program [3/]

[1/] Rail Cost Adjustment Factor Forecast, March 2012, Global Insight. If there is no FSC in 2010 actual data, RCAF-U is applied.
[2/] Transportation Escalator from the Annual Energy Outlook 2012, 2009-2035
[3/] EIA 2012 forecasts of WTI in its Short Term and Annual Energy Outlooks.

As summarized in Table III-A-6 above, DuPont adjusted the "Revenues Less Fuel Surcharge" portion of revenues during the 2011-2015 time period, based on NS' internal forecasts. During the 2016-5/31/19 time period, DuPont used the Global Insights March 2012 forecast of the AAR All Inclusive Index Less Fuel ("AII-LF") for all commodities except coal. Coal rates were adjusted using the annual percentage change in the 2012 AEO's Transportation Rate Escalator for the Eastern U.S., consistent with Board precedent.[24]

DuPont's forecasting procedures for the 2011 through 2015 portion of the study period, for each commodity group shown in Table III-A-1 above, are described as follows:

[24] EIA uses its Transportation Rate Escalators to forecast future coal transportation prices. It applies the escalators based on coal origins. EIA uses its Eastern Escalator for coal originating east of the Mississippi River, and its Western Escalator for coal originating west of the Mississippi River. Coal produced in the Powder River Basin or Rocky Mountains and destined to locations east of the Mississippi River would have transportation rates adjusted based on the Western Escalator. *See, e.g.*, *WFA/Basin* at 30; *PSCo/Xcel* at 55.

1. DuPont forecasted the revenues by developing indices based on the NS forecasts that separately recorded "Revenues Less Fuel Surcharge" and "Fuel Surcharges" ("FSC") for all commodity groups;

2. DuPont restated "Revenues Less Fuel Surcharge" on an average per unit basis for each forecast year from 2011-2015 by dividing the applicable "Revenues Less Fuel Surcharge" by the corresponding shipments in the NS provided forecasts for each commodity group. DuPont then developed an annual growth rate for each commodity group based on the annual average per unit revenues;

3. For the "Revenues Less Fuel Surcharge", DuPont applied either the commodity-group-specific revenue-per-unit growth index developed from NS forecasts or the applicable contract rate adjustment mechanism for each DRR shipment, as appropriate;

4. For movements where contract data was provided by NS, contract rate adjustment mechanisms were used to forecast the "Revenues Less Fuel Surcharge" portion of revenues for the duration of the contract term;

5. After expiration of the contract, "Revenues Less Fuel Surcharge" were adjusted based on the commodity-group-specific revenue-per-unit growth index DuPont developed from NS forecasts; and

6. If no contract was provided by NS, "Revenues Less Fuel Surcharge" were adjusted based on the commodity-group-specific revenue-per-unit and growth index DuPont developed from NS forecasts for 2011-2015.

DuPont assumed that moves subject to NS fuel surcharge ("FSC") programs in 2010 will be subject to NS fuel surcharge programs throughout the SAC analysis period. DuPont separated the 2010 fuel surcharge revenue from the movement revenues described above and forecasted the two revenue components separately.[25] The fuel surcharge portion of the revenues for these movements was adjusted based on the fuel surcharge growth rate implicit in the NS fuel surcharge tariffs and the price of West Texas Intermediate ("WTI") fuel based on the EIA's Short Term Energy Outlook ("STEO") and Annual Energy Outlook ("AEO") forecasts.

DuPont adjusted revenues for movements that were not subject to NS fuel surcharge programs in 2010 based on the Global Insights March 2012 forecast of the Unadjusted Rail Cost

[25] This revenue split was made for all traffic except automotive related traffic. Total movement revenues for automotive traffic were treated as base revenues for forecasting purposes because the NS provided forecast data did not separate revenues between base revenues and FSC revenues.

Adjustment Factor ("RCAF-U"). In addition, because NS forecasts did not separate fuel surcharges from total revenues for automotive traffic, the RCAF-U index was applied to total automotive traffic revenues when contract rates and terms were not available.

c. Revenue By Traffic Type

The 2010 DRR revenues by commodity type outlined in the previous section are discussed and summarized by traffic type in this section. DRR handles single-line traffic, interline traffic, cross-over traffic and re-routed traffic.

Single-line traffic is traffic that originates and terminates on the DRR. Interline traffic is traffic that either originates or terminates on the DRR and is interchanged with a railroad other than NS. Cross-over traffic is traffic that presently moves over a portion of the NS system that is beyond that which the DRR replicates and is interlined between the DRR and NS. Re-routed traffic is traffic that moves over a different route than historically used by NS but does so more efficiently on the DRR.

The total revenue attributable to the DRR equals $6,643 million in 2010 as shown in Table III-A-7 below by traffic type. Re-routed traffic revenues are included in Table 7 below in the appropriate category of traffic.

Table III-A-7
Summary of DRR 2010 Net Revenue
($ in millions)

	Revenue by Traffic Type			
Traffic Type (1)	**Single-Line** (2)	**Interline** (3)	**Cross-Over** (4)	**Total** (5)
1. General Freight	$337.7	$598.9	$3,012.6	$3,949.3
2. Coal	28.3	157.7	1,113.9	1,299.9
3. Intermodal	166.7	127.2	1,099.7	1,393.6
4. Total	$532.7	$883.8	$5,226.2	$6,642.8

Source: e-workpapers "III-A-Tables.xlsx"

Each of the four traffic types is discussed further below.

i. Single-Line Traffic

In its first partial calendar year of operation (June 1, 2009 through December 31, 2009), the DRR handles 116,190 carloads of general freight, 14,103 carloads of coal, and 222,138 intermodal containers/trailers in single-line service, i.e., service in which both the origin and the destination are located on the DRR. In the first full calendar year of operations (2010), the DRR handles 193,661 carloads of general freight, 12,038 carloads of coal, and 343,065 intermodal containers/trailers in single-line service. By the tenth year of operation (June 1, 2018 through May 31, 2019), the DRR will handle 276,718 carloads of general freight, 17,480 carloads of coal, and 609,160 intermodal containers/trailers in single-line service.

DRR revenue for single-line traffic was developed assuming 100 percent of the NS movement revenue accrues to the DRR. The total revenue for all single-line DRR traffic is shown in DuPont's workpapers.[26]

ii. Interline Traffic

In the first partial calendar year of operations (June 1, 2009 through December 31, 2009), the DRR handles 155,369 carloads of general freight, 70,730 carloads of coal traffic and 176,400 containers/trailers in interline service, i.e., traffic that involves at least one interchange with a railroad other than NS and where DRR handles the traffic between the same two stations as NS. In the first full calendar year of operation (2010), the DRR handles 256,787 carloads of general freight, 101,207 carloads of coal, and 262,661 intermodal containers/trailers in interline service. In the peak year of operations (June 1, 2018 through May 31, 2019), 355,873 carloads of general

[26] *See* e-workpapers "2010 IM.xlsx"; "2010 GEN Merch.xlsx"; "2010 COAL 80-Chem 40 – AUTO 60.xlsx"; and "2010 AG 10.xlsx."

freight, 117,586 carloads of coal traffic and 462,661 containers will move over the DRR in interline service.

DRR revenues for this traffic are the same as revenues generated by NS on the same movements. The total revenue for interline traffic handled by DRR is summarized in DuPont's workpapers.[27]

iii. Cross-Over Traffic

The largest grouping of traffic handled by the DRR is cross-over traffic; *i.e.,* traffic that currently moves over a larger portion of the overall NS system than is replicated by the DRR. These shipments are assumed to be interlined between the DRR and NS. The DRR portion of revenues for these movements is calculated using the Modified Average Total Cost ("ATC") revenue division approach pursuant to the Board's decision in *Major Issues.*[28]

In implementing the STB's ATC methodology, DuPont encountered multiple problems with the NS provided electronic data. A summary of these problems and the modifications made by DuPont to overcome the NS data deficiencies is included in Exhibit III-A-3. A detailed description of the methodology followed by DuPont to calculate DRR's share of revenue on cross-over traffic is included in DuPont's electronic workpapers.[29]

The steps followed by DuPont to implement the ATC methodology follows:

i. Variable Costs – DuPont calculated variable costs per unit for both the DRR segment ("on-SARR") and the residual NS segment ("off-SARR") of each cross-over movement in the DRR traffic group. Variable costs were developed using the nine (9) URCS Phase III inputs identified in *Major Issues*.[30] DuPont

[27] *See* e-workpapers "2010 IM.xlsx"; "2010 GEN Merch.xlsx"; "2010 COAL 80-Chem 40 – AUTO 60.xlsx"; and "2010 AG 10.xlsx".

[28] As modified by the STB in *WFA/Basin* at 12-14 and *AEPTexas* at 11-16.

[29] *See* e-workpaper "DuPont_ATC_Metholology.docx."

[30] The STB stated that its June 27, 2011 decision in *AEPCO* "properly framed this issue for future rate litigants to consider and brief" at 36. The STB's June 27, 2011 *AEPCO* decision related to the calculation of variable costs for the maximum markup methodology ("MMM") model and not the ATC model. Exhibit III-A-3 explains, in part, why the URCS Phase III variable costs should not be adjusted in the ATC model.

utilized the Board's 2010 NS URCS unit costs to develop the URCS Phase III costs for both the on-SARR and off-SARR segments.

ii. Fixed Costs Per Route Mile – DuPont calculated fixed costs per route mile for both the on-SARR and off-SARR segments of each cross-over movement in the DRR traffic group. DuPont first calculated the density for each segment of the entire movement of DRR cross-over traffic (both on-SARR and off-SARR). DuPont developed density data by segment from data produced by NS in discovery. The density data was developed on a net ton basis as called for in the STB's ATC methodology. DuPont then calculated the NS fixed cost per route mile[31] by subtracting NS's total system variable costs from NS's total costs as developed in URCS and dividing the difference by NS's total system route miles.[32]

iii. Fixed Costs Per Ton – With the fixed cost information developed above, DuPont calculated the fixed cost per net ton for each segment of the actual route of movement of the cross-over traffic. NS's fixed cost per ton was calculated by multiplying the NS fixed cost per route mile by each segment's route miles and dividing the resulting aggregate fixed cost per segment by the density for each segment. DuPont aggregated the DRR fixed cost per net ton for the DRR (on-SARR) segments and aggregated the residual NS fixed cost per net ton for the non-DRR (off-SARR) segments of the total movement.[33]

iv. Net SARR Revenue – On-SARR variable costs plus the off-SARR variable costs were subtracted from the total NS net revenue.[34] If the result was negative (i.e., variable costs exceeded revenues), then the NS net revenues were allocated to the DRR and residual NS based on the ratio of on-SARR to total variable costs and the ATC process for the movement was complete. If the result was positive (i.e., revenues exceeded variable costs) then the total movement contribution was calculated by subtracting the total variable costs from the total NS revenues. The contribution was allocated between the DRR and residual NS as follows:

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31 Because of the limitations of NS data, DuPont did not calculate a separate fixed cost per route mile for trackage rights segments. Instead DuPont calculated a fixed cost per route mile for all segments (the sum of NS owned segments and NS trackage rights segments). DuPont's calculations are described more fully in Exhibit III-A-3.

32 Total route miles are from NS's 2010 Annual Report Form R-1, Schedule 700, Line 57, Column (c).

33 In performing the calculations described above, DuPont relied upon NS provided car and intermodal event data produced in discovery and additional publicly available data from PC*MILER/Rail. PC*MILER/Rail was used primarily to identify the actual detailed route of movement on-SARR and off-SARR for each shipment. It was also used to identify the stations on the DRR system where cross-over traffic is either received from NS or would enter the DRR system and where cross-over traffic is interchanged to NS for off-SARR delivery or would leave the DRR system. PC*MILER/Rail is point-to-point rail routing, mileage and mapping software for the North American rail network. The software is available for purchase and is utilized by the STB and the railroad industry.

34 In developing the ATC divisions, URCS variable costs and URCS-based fixed costs are used. Implicit in URCS costs are total NS fuel costs recovered through the base rates plus the fuel surcharge. Therefore, to ensure that the costs and revenues that are used to allocate are on the same basis, total net revenues including fuel surcharges are included in this calculation.

(1) Calculate the total cost per ton for both the on-SARR and off-SARR segments for each movement by adding the variable cost per net ton and the fixed cost per net ton;

(2) Calculate the ratio of on-SARR total costs to full movement total costs; and

(3) Apply the item (2) ratio to the total contribution for the evaluated movement and add this result to the on-SARR variable cost to arrive at the DRR share of the total movement revenue for each cross-over movement.

The DRR ATC revenue division ratios developed using the above procedures are held constant during each year of the DCF model life, regardless of when the movement over the DRR starts or terminates.[35] A complete summary of DuPont's cross-over revenue allocations using the ATC methodology is shown in our workpapers.[36]

iv. <u>Re-routes</u>

DRR movements that were internally rerouted required a special procedure. Specifically, DuPont identified the portion of NS revenue attributable to the actual on-SARR route of movement for these shipments and assigned that portion of total revenue to the DRR. Stated differently, the ATC calculation was based on real-world routes of movement, not the SARR reroutes.

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[35] *See AEP Texas* 2006 at 3.

[36] *See* e-workpapers "2010 IM.xlsx"; "2010 GEN Merch.xlsx"; "2010 COAL 80-Chem 40 – AUTO 60.xlsx"; and "2010 AG 10.xlsx".

Part III-B

III. B. STAND-ALONE RAILROAD SYSTEM

The testimony in this Part is being sponsored by Richard H. McDonald, President of RHM Consulting, Inc. and Charles A. Stedman of L.E. Peabody & Associates, Inc. Their credentials are detailed in Part IV and summarized herein. Mr. McDonald has over 40 years of experience in the railroad engineering and operations fields, primarily at the former Chicago and NorthWestern ("CNW") which is now part of the Union Pacific Railroad. Mr. McDonald began his railroad career in 1958 at the New York Central Railroad, where he held positions as Assistant Engineer, Roadmaster and Division Engineer (for both the New York Central and Penn Central). In 1974, Mr. McDonald left Penn Central and joined CNW, where he held several positions of increasing responsibility in the Engineering and Operating Departments including Assistant Division Manager-Engineering and later Division Manager at St. Paul, MN, Vice President-WRPI, Vice President-Operating Administration, Vice President-Transportation, Vice President-Operations, and Vice President-Planning & Acquisitions.

Mr. Stedman has over thirty (30) years of experience in solving economic, marketing, transportation and fuel supply problems. He has directed and performed extensive analyses in the area of stand-alone costing, including route layout, design and construction costs, as well as the development of detailed operating plans for various stand-alone railroads.

1. Routes and Mileage

The DRR is an extensive system that has essentially twenty-three (23) main line segments. The twenty-three (23) main line segments include:

1. Chicago, IL east to Bellevue, OH;
2. Chicago, IL east to Cleveland, OH;
3. Calumet City, IL south to Bement, IL;
4. Kansas City, MO east to Mosser/Decatur, IL;
5. St. Louis, MO east to Fort Wayne, IN;
6. East St. Louis, IL east to Danville, KY;
7. Bellevue, OH north to Detroit, MI;
8. Bellevue, OH east to Harrisburg, PA;

9. Buffalo, NY east to Rockville, PA;
10. Harrisburg, PA east to Bayway, NJ;
11. Banks, PA east to Edgemoor, DE;
12. Harrisburg, PA south to Roanoke, VA;
13. Roanoke, VA east to Petersburg, VA;
14. Roanoke, VA southwest to Chattanooga, TN;
15. Bradley, TN south to Cohutta, GA;
16. Bellevue, OH south to Walton, VA;
17. Columbus, OH south to Chattanooga, TN;
18. Chattanooga, TN south to New Orleans, LA;
19. Chattanooga, TN west to Memphis, TN;
20. Burstall, AL south to Mobile, AL;
21. Lynchburg, VA south to Atlanta, GA;
22. Austell, GA west to Birmingham, AL; and
23. Ooltewah, TN south to Mahrt, AL.

The DRR includes 36 branch lines across the system. The DRR constructs all or part of 27 branch lines and 9 are operated utilizing trackage rights and joint facility agreements. These branch lines serve DuPont issue locations, power plants and other industrial destinations, water/rail transfer terminals, and interchange locations. The total route miles operated by the DRR equal 8,091.81. The DRR will construct 7,272.94 miles and utilize trackage rights and joint facilities agreements for the remaining 818.87 miles. The DRR's route is shown on Exhibit III-A-1. Exhibit III-A-1 also shows DuPont issue origins, destinations and interchange points.

The constructed route mileages for the DRR's main and branch line segments are summarized in Table III-B-1 below.[1] NS operating timetables and track charts that were used to develop the DRR rail lines being replicated, which were produced by NS in discovery, are the primary source documents used to identify the DRR route mileages.[2] Maps and schematics of various parts of the DRR route that were used to develop the DRR route miles are also included in DuPont's opening work papers.[3]

[1] *See* e-workpaper "DuPont RR Route Miles Opening.xlsx."

[2] The timetable and track chark pdf files provided by NS in discovery are included in DuPont's opening electronic work papers.

[3] *See* e-workpaper "Additional DRR mileage support.pdf."

Table III-B-1
DRR Constructed Route Mileage

	Segment (1)	Constructed Miles (2)
1.	Chicago, IL east to Bellevue, OH	273.14
2.	Chicago, IL east to Cleveland, OH	334.35
3.	Calumet City, IL south to Bement, IL	40.02
4.	Kansas City, MO east to Moser/Decatur, IL	335.28
5.	St. Louis, MO east to Fort Wayne, IN	343.55
6.	East St. Louis, IL east to Danville, KY	353.04
7.	Bellevue, OH north to Detroit, MI	66.19
8.	Bellevue, OH east to Harrisburg, PA	443.98
9.	Buffalo, NY east to Rockville, PA	260.63
10.	Harrisburg, PA east to Bayway, NJ	147.44
11.	Banks, PA east to Edgemoor, DE	88.27
12.	Harrisburg, PA south to Roanoke, VA	313.98
13.	Roanoke, VA east to Petersburg, VA	174.26
14.	Roanoke, VA southwest to Chattanooga, TN	389.77
15.	Bradley, TN south to Cohutta, GA	13.93
16.	Bellevue, OH south to Walton, VA	458.34
17.	Columbus, OH south to Chattanooga, TN	447.76
18.	Chattanooga, TN south to New Orleans, LA	504.30
19.	Chattanooga, TN west to Memphis, TN	271.00
20.	Burstall, AL south to Mobile, AL	250.32
21.	Lynchburg, VA south to Atlanta, GA	467.00
22.	Austell, GA west to Birmingham, AL	141.31
23.	Ooltewah, TN south to Mahrt, AL	347.03
24.	Total Main Line Route Miles	6,474.89
25.	Total Branch Line Miles	798.05
26.	Total constructed route miles	7,272.94

Source: e-workpaper "DuPont RR Route Miles Opening.xlsx"

All of the 7,272.94 route-miles shown in Table III-B-1 represent lines that are being constructed by the DRR. In addition, the DRR operates over 818.87 miles using trackage rights and joint facilities agreements. The DRR's rail lines are shown in the stick diagrams for the DRR. The stick diagrams are the track charts for the DRR.[4]

The DRR interchanges traffic with six (6) Class I railroads (UP, BNSF, CN, CSXT, KCS and NS) along with numerous regional and short-line railroads that NS actually interchanges with today.[5]

2. Track Miles and Weight of Track

The DRR's track and yard configuration was developed by DuPont's expert operating witnesses McDonald and Stedman. The system configuration was developed to accommodate the DRR's traffic group, using several tools, including information provided by DuPont Witness Nolan (and supported by data produced by NS) concerning the DRR's peak-year traffic volumes and flows, and the trains that will move over the DRR system in the peak week of the peak traffic year; the DRR operating plan developed by Mr. McDonald; NS's operating timetables and track charts for the divisions and subdivisions involved; and a simulation of the DRR's operations executed by Mr. Daniel Fapp using the Rail Traffic Controller ("RTC") model, which has been accepted by the Board as an appropriate operational modeling tool in several previous rail rate cases.[6] The DRR stick diagrams contain detailed track diagrams for the entire DRR system.

The DRR's track miles are shown in Table III-B-2 below.[7]

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[4] *See* e-workpaper "DRR Opening Sticks.pdf."

[5] A listing of DRR major interchanges is included in e-workpaper "DRR interchanges.xlsx."

[6] *See, e.g.*, *PSCo/Xcel* at 27; *WFA/Basin* at 15. A detailed explanation of the RTC Model simulation that was conducted in developing the DRR system configuration is set forth in Part III-C-2.

[7] *See* e-workpapers "DuPont RR Route Miles Opening Grading.xlsx." and "DRR Yard Matrix.xlsx."

Table III-B-2
DRR Constructed Track Miles

Type of Track (1)	Constructed Miles (2)
1. Main line track	
a. Single first main track[1/]	7,272.94
b. Other main track[2/]	3,204.31
c. Total main line track	10,477.25
2. Helper pocket and setout tracks	74.62
3. Yard tracks (include interchange tracks)[3/]	880.34
4. Total track miles	**11,432.21**

[1/] Single first main track miles equal total constructed route miles including branch lines, but excluding yard tracks and the 818.87 route miles of trackage rights that are operating miles that the DRR does not construct.
[2/] Equals total miles for constructed other main tracks and passing sidings.
[3/] Includes all tracks in yards, such as locomotive repair and servicing tracks and classification storage tracks.

a. Main Line

As shown in the DRR stick diagrams, the DRR's main line consists of single main track with sections of additional main track (including signaled passing sidings) at appropriate intervals to enable the DRR to move its peak period trains efficiently and without delay. The DRR has a total of 10,477.25 single main track miles and other main track/passing sidings.

All constructed main track and passing sidings in line segments carrying 20 million tons or more gross tons per year ("MGT") consist of new 136-pound continuous welded rail ("CWR"). Standard rail is used for all mainline track except that premium (head-hardened) rail is used on curves of 3 degrees or more, where rail wear is heaviest. The main tracks in segments carrying less than 20 MGT consist of new 115-pound CWR.

All of the DRR's track and structures are designed to accommodate a gross weight on rail ("GWR") of 286,000 pounds per car and maximum train speeds of 60 mph, conditions permitting.

b. <u>Branch Lines</u>

As described above, the DRR will construct all or part of 27 branch lines and operate 36 branch lines in total. These branch lines are used to serve industrial facilities (including DuPont issue locations), destination power plants, water/rail transfer terminals, and interchange points. The track configurations for these branches are shown in the DRR stick diagrams.

c. <u>Sidings</u>

The DRR's passing sidings are considered part of its main tracks in both main lines and branch lines, and are discussed in Subparts a. and b. above.

d. <u>Other Tracks</u>

Other tracks include pocket tracks for helper locomotives and set-out tracks for bad order cars. Yard tracks (including interchange tracks) are discussed in the next section.[8]

e. <u>Helper pocket and other setout tracks</u> -- The DRR has 4 helper districts as described in Part III-C. Each helper district has helper pocket tracks at both ends of the district if no yard exists. These tracks are double-ended tracks, 600 feet in length.

In addition, one setout track is placed on each side of each of the DRR's Failed-Equipment Detectors ("FEDs"), as described in Parts III-C and III-F, with one FED on each track in areas with multiple main tracks. All of these setout tracks are single-ended tracks, 735 feet in length. This provides 600 feet in the clear, past the switch, to accommodate both the occasional bad-order car and the temporary storage of maintenance-of-way ("MOW") equipment.

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[8] *See* e-workpaper "DRR Yard Matrix.xlsx."

The locations of the helper pocket and setout tracks are shown in the DRR stick diagrams.[9] They consist of 115-pound new CWR. The DRR has a total of 74.62 track miles for these tracks.

3. Yards

The DRR has a total of one hundred nineteen (119) yards. This total includes (6) major yards, thirty five (35) mid-size yards, where yard crews are employed and seventy eight (78) other yards. These yards are used for train staging, 1000/1500-mile car inspections, crew changes, locomotive servicing and fueling, interchanges, local train operations and originating/terminating traffic. A listing of all the DRR yards is included in DuPont's opening work papers.[10] Table III-B-3 below shows the DRR major yard locations.

Table III-B-3
DRR Major Yard Locations

	Location (1)
1.	Elkhart, IN
2.	Conway, PA
3.	Roanoke, VA
4.	Chattanooga, TN
5.	Atlanta, GA
6.	Bellevue, OH

Source: *See* e-workpaper "DRR Yard Matrix.xlsx".

a. Major Yard Characteristics

Car inspections are performed at all DRR major yards. Fueling platforms are located at all major yards. Locomotive shops are located at Elkhart, Roanoke, Chattanooga and Bellevue. Crew change facilities are located at all major yards.

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9 *See* e-workpaper "DRR Opening Sticks.pdf."

10 *See* e-workpaper "DRR Yard Matrix.xlsx."

b. Miles and Weight of Yard Track

The DRR's one hundred nineteen (119) yards contain a total of 880.34 miles of track.[11] The yard tracks have 115-pound new CWR.

4. Other

a. Joint Facilities

The DRR utilizes 818.87 miles of joint facilities owned by other carriers. A complete description of the joint facilities used by the DRR and owned by other carriers is included in Part III-C.

b. Signal/Communications System

Current federal law mandates that the DRR be equipped with Positive Train Control ("PTC") by December 31, 2015. Rather than construct a Central Traffic Control ("CTC") system at the outset of DRR operations (June 1, 2009) and then convert it to PTC, the DRR will install PTC at the beginning of DRR operations. The PTC system is discussed in more detail in Part III-F-6. Power switches also are used for the connections between the main line and the DRR's branch lines, the helper pocket and setout tracks, the yard lead and relay tracks, and the connections to local origins and destinations. Interior yard switches and set-out track switches are hand-thrown switches.

Communications are conducted using a microwave system, with microwave towers at appropriately-spaced intervals as described in Part III-F-6. All locomotive engineers, dispatchers and field supervisory personnel are equipped with radios connected to the microwave system. Certain employees also will be equipped with cellular telephones for emergency railroad use, as a back-up to the radios. Further details on the DRR's signal and communications system are provided in Part III-F-6.

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[11] *See* e-workpaper "DRR Yard Matrix xlsx."

c. Turnouts, FEDs and AEI Scanners

All turnouts between the DRR's main tracks are No. 20 turnouts. This permits trains to operate through the turnouts at speeds of up to 40 miles per hour (conditions permitting). No. 20 turnouts also are used for connections between the main line and branch lines, as well as for the yard leads and the main running tracks at both ends of each of the DRR's yards. No. 14 turnouts are used between main tracks and all other tracks, including the connections with the origin and destination spurs, and helper pocket tracks, where trains move at slower speeds. Trains can operate through these turnouts at a speed of up to 25 miles per hour. No. 10 turnouts are used within yards and for setout and MOW equipment storage tracks.

FEDs, which include hot-bearing, dragging-equipment, cracked-wheel and wide/shifted load detection systems, have been spaced approximately every 35 miles along the DRR's route. Multiple FEDs are provided at each location that has multiple main tracks, one for each track. Each FED is accompanied by two setout tracks, each located within two miles on either side of the FED. Each such track is a 735-foot single-ended track (with 600 feet in the clear) to facilitate the setout of bad-order cars after a train has passed an FED. These tracks are used primarily for temporary storage of bad-order cars detected by the FEDs, as well as for temporary storage of work equipment.

Automatic Equipment Identification ("AEI") scanners are located at or near each of the locations where the DRR interchanges trains with other railroads as described above. A total of 108 AEI scanners have been provided. The AEI scanners have been placed so as to enable them to capture all train movements that occur on the DRR, including both local and interline movements.

Part III-C

III. C. STAND-ALONE RAILROAD OPERATING PLAN

The operating plan for the DRR was designed by Richard H. McDonald, one of the nation's leading rail operations and management experts, with assistance from Mr. Philip H. Burris of L. E. Peabody & Associates, Inc. who developed the operating specifications and Mr. Daniel L. Fapp and Mr. William W. Humphrey also of L. E. Peabody & Associates, Inc. who performed a simulation of the DRR's peak-period operations using the Rail Traffic Controller model ("RTC Model") with operating inputs provided by Mr. McDonald.

The operating plan is designed to enable the DRR to transport its peak-year traffic volume, and the trains moving on the system during the peak week of the peak year, in a manner that meets the transportation needs of its traffic group, and in full compliance with all applicable NS transportation and service commitments to the customer group involved. The operating plan and the RTC Model are used to optimize the DRR's system track configuration, as described in Part III-B, and provide the basis for many of the DRR's annual operating expenses shown in Part III-D.

A key series of NS records needed to perform the multiple, inter-related analyses required to produce a viable operating plan for the SARR are the NS' train event records or train movement data. DuPont requested train event records from NS in the discovery phase of this proceeding through Requests for Production No. 21 and No. 22. In response, NS provided eight text files that included limited train event data for 2009 and 2010.

We developed Exhibit III-C-1 in order to identify the numerous problems and errors included in the NS provided train event data that resulted in a huge increase in DuPont analytical time in order to evaluate and utilize the NS provided train event data. In addition, Exhibit III-C-1 documents the numerous "fixes" that DuPont had to employ in order to utilize this NS provided train event data.

1. General Parameters

The DRR's configuration and operating plan have been designed to accommodate its peak seven-day traffic volume and train frequencies during the 10-year DCF period. The peak traffic volume and train movements were developed by DuPont Witness Fapp using the 2009 and 2010 traffic and car/train movement data provided by NS in discovery, and the traffic forecast procedures described in Part III-A-2.

The DRR system and operating plan were developed as follows. First, Mr. McDonald reviewed the NS operating timetables and track charts for the lines being replicated,[1] as well as maps of various facilities, joint facility/joint use agreements between NS and other railroads for the lines being replicated, and NS interrogatory responses describing the operation of DuPont traffic and other trains. A preliminary track configuration for the DRR was developed, starting with NS's present main-track/passing siding configuration for all of the lines being replicated. Then, the operating plan elements to be input into the RTC Model were developed.

The DRR operating plan was developed to accommodate the railroad's peak year traffic group. As indicated in Part III-A, the DRR's peak traffic year is June 1, 2018 through May 31, 2019, which is also the final 12-month period in the 10-year DCF. As described in Part III-A-1, the DRR's traffic group consists of general freight, coal, and intermodal traffic moving primarily in trainload service. The traffic moves in various flows over different parts of the system. The DRR peak year total traffic volumes are shown in Table III-C-1 below.

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[1] The NS operating timetables and track charts for all of the lines involved are reproduced in Part III-B e-workpapers.

Table III-C-1
DRR Peak Year Traffic Volume – 3Q18 to 2Q19

Train Type (1)	Cars/ Containers (2)	Millions of Tons (3)
1. General Freight		
a. Local	276,718	25,821,923
b. Interline	355,873	30,075,821
c. Overhead	2,337,362	187,544,710
2. Coal		
a. Local	17,480	1,812,676
b. Interline	117,586	13,659,735
c. Overhead	1,493,522	161,773,037
3. Intermodal		
a. Local	609,160	8,681,768
b. Interline	462,661	6,357,862
c. Overhead	4,107,981	56,881,545
4. Total	**9,778,343**	**492,609,078**

Source: *See* e-workpaper "III-A-Tables.xls."

The DRR's operating plan reflects the different commodities it handles and the types of service they require. The DRR serves various local origins and destinations, including industrial facilities, coal mines, power plants, intermodal ramps, and water/rail transfer terminals. The DRR also serves interchange points with other railroads including BNSF, NS, CSXT, KCS, CN, CP and UP and more than 40 regional and short line railroads.

As described in Part III-B, the DRR has been divided into twenty-three (23) mainline segments and thirty-four (34) branch lines. A schematic of the DRR's route is attached as Exhibit III-A-1.

a. <u>Traffic Flow and Interchange Points</u>

The DRR's peak-year (June 1, 2018 through May 31, 2019) traffic volume consists of 243 million tons of general freight traffic, 177 million tons of coal traffic, and 72 million tons of intermodal traffic. The traffic density varies over different line segments. The busiest segments are Chicago to Toledo and Conway to Harrisburg. The Base Year trains moving over several DRR's line segments are shown in Table III-C-2 below.

Table III-C-2
Base Year Trains By Line Segment
(trains moving in the peak simulation period)

Line Segment[1/] (1)	No. of Trains (2)
1. Chicago, IL – Elkhart, IN	17,209
2. Elkhart, IN – Toledo, OH	10,210
3. Altoona, PA – Conway, PA	17,104
4. Conway, PA – Harrisburg, PA	16,737
5. Danville, KY – Cincinnati, OH	7,530
6. Columbus, OH – Dickinson, WV	2,545
7. Harrisburg, PA – Roanoke, VA	4,545
8. Cleveland, TN – Knoxville, TN	3,020
9. Chattanooga, TN – Memphis, TN	4,953
10. Altanta, GA – Birmingham, AL	5,458

Source: *See* e-workpaper "Unique Crew Locations.xlsx"
[1/] Trains shown for a line segment are the maximum trains moving over any part of the segment – volumes may not be uniform for the entire segment.

The DRR handles DuPont traffic from origin to destination or to terminating carrier. It also directly serves three coal mine origins or coal loadout facilities in Indiana, Kentucky and West Virginia, and 29 coal destinations (23 power plants and six rail/water transload facilities) to which it delivers 129 million tons of coal in 2010. The DRR also handles coal originated and terminated by other railroads. In addition, the DRR handles other general freight and intermodal traffic in interline and local service, interchanging such traffic with other railroads across the DRR system.

The DRR's operating plan takes into account its total traffic volume and the traffic flows described in Part III-A and summarized above and also reflects the DRR's interchange relationships with the other Class I carriers and various regional and short line railroads. These relationships are based on NS's joint use and interchange agreements with such carriers; the DRR steps into NS's shoes under these agreements. All trains interchanged with other railroads are run-through trains, which mean the locomotive power stays with the train.[2]

b. Joint Use and Interchange Agreements

The DRR steps into the shoes of NS and utilizes existing joint use and trackage agreements at 32 locations. A brief description of each one of these agreements is included in Exhibit III-C-2.

c. Track and Yard Facilities

The DRR's track and yard facilities are described in Part III-B-2.[3] The DRR's main lines consist of single track with appropriately-spaced sections of second main track (essentially signaled passing sidings with power switches). The branch lines consist of a single main track, with passing sidings as needed to efficiently move the traffic. The siding configuration and spacing were developed by DuPont Witness McDonald with assistance from Witnesses Fapp and Humphrey's RTC Model simulation of the DRR's peak-period operations.

All of the DRR's main tracks are constructed to a standard that allows for maximum train speeds of 60 mph, conditions (including gradient and curvature) permitting. Trains on all branch lines are limited to a maximum speed of 40 mph, except where existing NS speed limits are higher. All tracks are being constructed to permit a maximum GWR of 286,000 pounds per car.

All of the DRR's main lines are equipped with PTC and main-track power switches. Power switches are also installed at a few key points on the DRR's branch lines.[4]

Wood crossties are being used on all DRR tracks. The tie and other track and subgrade specifications (including rail section, turnouts, other track material, ballast and side slopes) are

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[2] *See* e-workpaper "DRR Interchange.xlsx."

[3] *See* e-workpaper "DRR Yard Matrix.xlsx."

[4] *See* e-workpaper "DRR Yard Matrix.xlsx."

described in Parts III-F-2 and III-F-3 and associated e-workpapers. The track and subgrade specifications enable the DRR to handle its expected peak-period traffic volume efficiently, consistent with lowest feasible cost, while enabling all customer service requirements to be met.

d. Crew-Change Locations/Times

i. Road Crews -- Many of the DRR's crew changes take place at origins, yards, interchange points or destinations. The DRR follows the efficient modern railroad practice of calling train crews sufficiently in advance of a train's arrival at the designated crew-change point so that the crew is ready to board the train when it arrives and the in-coming crew has de-trained. The crews in each district are qualified to operate to and from other intermediate origins, destinations and interchange points within the district.

Mr. McDonald's operating plan for the DRR provides for straight-away and turn crew assignments at 28 crew district locations in the DRR's North Region and 20 crew locations in the DRR's South Region. The crew districts and assignments are listed in Exhibit III-C-3. Based on a review of materials provided by NS in discovery, many of the DRR crew assignments mirror those currently used by NS.

These crew districts and assignments reflect a least-cost SARR's flexibility to maximize the efficiency of its crew assignments within the constraints of the federal "12-hour" (hours of service) law, including the amendments thereto wrought by the recently-enacted Rail Safety Improvement Act of 2010 ("RSIA") (Public Law No. 110-432). Since the DRR is a new, start-up, non-unionized operation, its crew districts can be, and have been, designed for maximum efficiency. DRR road crews are not limited to operating over a single route, but instead are flexible enough to operate over several different routes on which they are certified. For example, crews stationed in the Harrisburg, PA area can operate west to Altoona and Conway, north to

Sunbury and Binghamton, east to Allentown and New Jersey, east to Baltimore or south to Shenandoah and Roanoke as necessary.

ii. Helper crews -- The helper crews are engineer-only crews. Helper service is provided at 5 locations on the DRR. A total of 32 employees are needed to staff the helpers on a 24/7 basis, with each crew working an eight-hour shift.

e. Switching and Yard Activity

i. Locomotive inspections and fueling -- FRA-required 92-day locomotive inspections are performed at DRR's locomotive shops and DRR yards during the car-inspection process for all trains receiving a 1500-mile or 1,000-mile car inspection.[5] DRR locomotive shops are located at Elkhart, IN, Conway, PA, Chattanooga, TN and Roanoke, VA. Road locomotive(s) requiring inspection are removed from the train and moved to the locomotive shops. If a locomotive requires fueling, but not a scheduled inspection, it is fueled during the dwell time of the car inspection process. Fueling is accomplished at stanchions provided in yards where shops are located and at other points where traffic warrants. All other fueling is performed by tanker truck. If a locomotive requires fueling but not a 92-day inspection, it is fueled during the dwell time allotted for car inspections.

ii. Railcar Inspections

(a) Inspection Procedures -- The DRR conducts 1,500-mile inspections of coal trains and 1,000-mile inspections of non-coal trains using state-of-the-art procedures, while complying at all times with FRA-mandated safety and inspection rules. DRR performs 1,500-mile and 1,000-mile inspections on through trains at Elkhart, IN, Conway, PA, Roanoke, VA, Chattanooga, TN, Atlanta, GA and Bellevue, OH. DRR also performs inspections

[5] Inspection procedures are further detailed below.

on originating trains by car inspection crews at fifteen (15) yard locations. Road train crews perform inspection functions at other yards as necessary.

DRR uses two and four-person inspection crews, with one crew member on each crew serving as foreman. A summary of the car inspection crews on duty at each of the fifteen (15) yards is included in DuPont's workpapers.[6]

Roadways are provided between each of the yard relay tracks where inspections are performed. Each inspection crew stationed at a yard is equipped with a low-slung, four-wheel ATV-type vehicle. The vehicles carry spare parts, such as brake shoes and air hoses. Some parts are also placed periodically adjacent to the rails on the inspection tracks for ready availability. Coupler knuckles are rarely replaced during 1,500- or 1,000-mile inspections and can be transported to a specific car needing a knuckle by a company pick-up truck as needed. Two trains are inspected simultaneously by a four-person crew.

(b) <u>Trains requiring inspection</u> -- Each of the DRR's yards where trains originate is an inspection point and all trains are inspected either by a car inspection crew or by the train crew. In addition, coal and non-coal trains that travel more than 750 miles on the DRR receive an inspection at one of the through train inspection locations listed previously.

f. Trains and Equipment

i. Train Sizes

The DRR operates complete trains, including general freight, coal and intermodal trains, in local and interline (including overhead) service. The DRR's train sizes are no larger than those for the comparable NS trains operated from June 1, 2009 through May 31, 2010 ("Base

[6] *See* e-workpaper "Inspection Teams.xlsx."

Year") for which NS produced car movement data. Non-coal trains that are interchanged with NS have the same mix of traffic as the comparable NS trains that moved between the same points inthe Base Year.

All trains have sufficient locomotives to provide a horsepower-to-trailing ton ratio that assures they are adequately powered to meet present contractual transit-time commitments and service requirements. This was confirmed by the RTC simulation.

The DRR operating plan assumes that the maximum train sizes (for a given train type) and locomotive consists will remain the same throughout the 10-year DCF period.[7] Increased volumes are accounted for by adding cars to existing trains consistent with the DRR's (and NS's) ability to handle them with the same locomotive consist and track configuration (yards/sidings). If a train would be too long using this procedure, "growth" trains are added that are equivalent or smaller in size to the comparable trains NS operated in the Base Year, as shown in the car event and train movement data it produced in discovery. The maximum train size is 207 cars and 8 locomotives. All growth trains are limited to the same size and weight, and no growth train has more than six (6) locomotives (excluding helpers).

ii. Locomotives

The DRR requires a total of 662 locomotives to handle its Base Year traffic volume. The railroad has three types of locomotives: GE ES44AC locomotives for road and helper service, GP-38 locomotives for local train and work train service and EMD SW1500 locomotives for yard switching service. The number of locomotives required for each kind of service is shown in Table III-C-3 below. The DRR's road locomotive requirements take into account the need to equalize the locomotive power used in run-through service for the NS and other

[7] Maximum train sizes were identified for each train symbol ("TRN") included in NS' train event data. As indicated in Exhibit III-C-1, however, NS' train event data was riddled with erroneous and missing information, including information on maximum train sizes.

interchange trains, any intermediate setting out or picking up of blocks of cars, and a spare margin which is described below.

Table III-C-3
DRR Peak Locomotive Requirements

Type of Service (1)	Quantity (2)
1. Road – ES44AC	481
2. Local/Work Train– GP38	101
3. Switch – SW1500	80
4. Total	622

Source: *See* e-workpapers "DRR Operating Expense.xlsx," Base Year Train List_Statistics_Open", tab "Local Locos" and "DRR Yard Locos.xlsx."

(a) Road Locomotives

The DRR's "standard" road locomotive consist for all trains is two locomotives in a 1/1 distributed power ("DP") configuration, although some heavy coal, general freight and intermodal trains require three or more road locomotives for all or part of their runs on the DRR system (not including helpers at certain locations). Where additional units are needed, they are placed at the front of the train. For example, all trains moving between Dickinson, WV and Elmore, WV require two additional locomotive units in each direction to traverse the grades in this area. As both Dickinson and Elmore are crew change points for these trains, the additional locomotives are added and removed at these locations when the crews are changed.

The DP configuration involves positioning one locomotive on the front of the train and one locomotive on the rear of the train (hence the "1/1" designation). The rear (DP) locomotive has no engineer and is remotely controlled by radio signals from the lead locomotive. The use of a DP locomotive configuration reduces the drawbar tension between cars and enables the same number of locomotives to haul heavier trains or the same size trains at higher speeds. It also facilitates reversal of direction by a train, as locomotives do not have to be repositioned from one end of the train to the other. DP locomotive configurations are standard practice on the western Class I railroads, and DP is also being used by NS.[8]

As stated previously, local trains and work trains are powered by GP38 locomotives, using one locomotive per train where possible. When this is not possible due to train size or topography, the DRR adds a second GP38 locomotive, or in some instances uses an ES44AC locomotive on local trains. The count of road locomotives for the peak year includes a spare margin and a peaking factor, consistent with prior STB decisions.[9]

Spare Margin -- The total number of road locomotives required includes a spare margin of { } percent for ES44AC locomotives and { } percent for GP38 locomotives. This spare margin is based on information provided by NS in response to DuPont's discovery requests. The information provided includes locomotive bad order time, transit time and total equivalent units in service by locomotive type for 2008, 2009 and 2010. From this information we developed the amount of time locomotive units were unavailable for service on a three year weighted average basis to yield the locomotive spare margin for both ES44AC locomotives and GP38 locomotives.[10]

Peaking Factor -- In addition to using the spare margin, DuPont's experts determined the DRR's locomotive peaking factor by dividing the average number of train starts per day in the peak week of the Peak Year by the average number of train starts per day moving in the Peak

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[8] *See, e.g.*, http://www.progressiverailroading.com/pr/article/Class-Is-employ-fuelsaving-practices-that-promise-stingier-diesel-usage--22736 and e-workpaper "Helper Service Locations (NS-DP-C-10310).pdf."

[9] *See WFA/Basin* at 33-34.

[10] *See* e-workpaper "Loco Utlization.xlsx" A similar calculation was accepted by the Board in *AEP Texas* at 43-44.

Year. This is the same process as that approved by the Board[11] and results in a peaking factor of 5.4 percent.[12]

(b) Helper Locomotives

The DRR uses ES44AC road locomotives for helper service to minimize the diversity of road locomotive types in DRR service. Where necessary the DRR uses one or more units in helper service, with the locomotives coupled back-to-back. This enables the helper consist to operate in either direction with the cab end forward on the lead locomotive. The DRR has five helper districts. Exhibit III-C-4 provides the location of the helper district, distance trains are helped, direction of helper service and the number of helper units per consist at each location.

The RTC Model simulation indicates that a total of 879 trains moving during the ten-day simulation period require helper assistance. The breakdown of these trains for the entire simulation period and for the peak day for each district, used to confirm the DRR's helper locomotive needs, is shown in Table III-C-4 below.

[11] *See PSCo/Xcel II* at 13.

[12] As indicated in Exhibit III-C-1, DuPont was required to adjust many of its peak period train statistics due to the flaws discovered in NS's train event data. Because making these adjustments to the entire peak year train lists would have been impossible in the time required to present this case, DuPont based its peaking factor on the pre-adjustment peak period and peak year train lists. *See* e-workpaper "Coal Train List.xlsx."

Table III-C-4
DRR Peak Trains Requiring Helper Assistance

Helper District (1)	Number of Trains: Helper Service Miles (2)	Number of Trains: Peak Period Trains per Day (3)
1. Louisville, KY to Duncan, IN	10.4	3.4
2. Bulls Gap, TN to Knoxville, TN	46.8	5.8
3. Cincinnati, OH to Erlanger, KY	7.8	15.0
4. Altoona, PA to Johnstown, PA	37.9	33.4
5. Johnstown, PA to Altoona, PA	37.9	30.3

Source: Exhibit III-C-4

(c) Switch/Work Train Locomotives

The DRR uses EMD SW1500 locomotives for switch service. This type of locomotive is commonly used by Class I and other railroads (including NS) for such service.

The DRR requires a total of 80 SW1500 locomotives for use in switch service. The number of locomotives assigned to each yard is dependent on the number of switch assignments working in each yard.

iii. Railcars

Car ownership for the DRR traffic group was determined from the shipment data produced by NS in discovery. This data shows that most of the DRR's general freight and coal traffic moves in shipper-provided equipment and that nearly all of its intermodal traffic moves in shipper-provided containers and trailers. It is assumed that all flatcars used to transport intermodal containers and trailers are system cars. Table III-C-5 below summarizes the ownership of railcars and intermodal units for each traffic type.

Table III-C-5
Percent Of Car Ownership By Traffic Type

Traffic Type (1)	System (2)	Foreign (3)	Private (4)
1. General Freight	19.9%	16.8%	63.3%
2. Coal	44.0%	2.9%	53.1%
3. Containers & Trailers	3.7%	0.0%	96.3%
4. Intermodal Flats	100.0%	0.0%	0.0%

Source: *See* e-workpaper "DRR Car Costs.xls."

The DRR car requirements for all of the movements in its traffic group were developed based on the 3Q09-2Q10 base-year traffic and the simulated transit time output from the RTC Model. The resulting DRR car requirements were increased by a { } percent spare margin[13] and the 5.4 percent peaking factor described earlier. A complete description of the development of car ownership costs for system, foreign and private cars is set forth in Part III-D-2.

g. RTC Model Procedures and Results

The essential elements of the operating plan (described above), the main-track configuration, and the yard and interchange locations were provided to Messrs. Fapp and Humphrey for input into the RTC Model. Messrs. Fapp and Humphrey also input various physical characteristics for these lines, which were obtained from NS track charts, operating

[13] The { } percent spare margin is based on a review of coal transportation contracts provided by NS in discovery which show spare margins which range from { } to a high { } percent. Further, review of the public record in *AEPCO* shows that both parties relied on a 5.0 percent spare margin, which is also based on review of transportation contracts in that proceeding, and is nearly the same as that used herein. *See* AEPCO's Opening Evidence (Public Version) in Docket. No. 42113 filed January 25, 2010 at III-C-15 and AEPCO's Rebuttal Evidence (Public Version) in Docket No. 42113 filed July 1, 2010 at III-C-16. In addition, the 5.0 percent spare margin for shipper-provided cars was accepted by the Board in *WFA/Basin* at 39 and *Otter Tail* at C-5, and was also based on the transportation contracts produced in discovery in those proceedings. DuPont is relying on public information and common industry practice concerning the railcar spare margin from other maximum rate proceedings as described above.

timetables and other documents produced in discovery, including RTC simulations performed by NS along the DRR's route. These included train speed restrictions at various locations, grades, curves, topography and turnouts (switches). The final steps were to populate the RTC Model with the DRR's trains during the simulation period, which includes the peak traffic week (in terms of train movements) in the DRR's 10-year DCF existence, and input random "outage" and maintenance events.

DuPont Witnesses Fapp and Humphrey developed DRR's trains moving during the peak-ten day simulation period in the DRR's 10-year DCF life, based on the NS trains carrying traffic in the DRR's traffic group that moved during the peak simulation period in the 2009-2010 Base Year, forecast to the same period in the June 1, 2018 through May 31, 2019 peak year.

All road trains and local trains carrying DRR identified cars moving on the DRR network were included in the RTC simulation. The simulation includes stops in route for crew changes, inspections, fueling, helper service and spotting and pulling cars at customer locations for all road trains and local trains operating in straight-away service between two locations. Local trains in turn service, i.e., trains identified in NS' train event data designated as local trains which originate and terminate at the same location, are also included in the RTC simulation. The data contained in NS' train event files for these trains related to their route of movement and stops in route is unintelligible at best. Through a laborious manual process, DuPont's consultants were able to estimate the furthest location from the train's home location traveled and have included in the simulation the movement of the local turn train from its home location to the furthest location and return. A description of the infirmities of the NS train event data, and the steps DuPont took to overcome these infirmities is included in Exhibit III-C-1.

The RTC simulation runs began after inputting the DRR's track and other relevant facilities, peak-period trains and operating parameters (including random outages and maintenance outages). Changes were made on an iterative basis until the RTC Model ran to a successful conclusion. These changes included the relocation, addition or deletion of certain passing sidings and segments of second main track, refinement of the locations and configuration of yards and interchange tracks, and the addition of locomotives to certain trains. A detailed description of the DRR modeling procedures and results is included in Exhibit III-C-5.

2. Cycle Time

A SARR's operating plan must enable it "to meet the transportation needs of the traffic the SARR proposes to serve."[14] As the Board noted in *WFA/Basin*, a SARR:

> need not match existing operating practices of the defendant railroad, as the objective of the SAC test is to determine what it would cost to provide the service with optimal efficiency. However, the assumptions used in the SAC analysis, including the operating plan, must be realistic, i.e., consistent with the underlying realities of real-world railroading.

Id. at 15. This means that the complainant shipper must demonstrate that its SARR can provide service to its customers (i.e., traffic group members) that meets their requirements. DuPont has accomplished this by showing that the train transit times during the peak period in the peak year are similar to or lower than the NS's actual cycle and transit times during the comparable period of the most recent year for which data is available.

The starting point for the analysis in this case is the DRR's peak-year traffic volume and its peak-period train counts, which were developed from NS's train movement and car movement data for the traffic included in the DRR's traffic group for 2009 and 2010, the most recent year for which such data was available. The peak trains, DRR system configuration and relevant aspects of the operating plan were then input into the RTC Model to verify that the configuration and operating plan are realistic and adequate to enable the DRR to operate its

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[14] *See WFA/Basin* at 15; ("the operating plan must be capable of providing, at a minimum, the level of service to which the shippers in the traffic group are accustomed").

peak-period trains efficiently and in accordance with its customers' requirements as measured by train cycle/transit times.

The key outputs generated by the RTC Model for the transit time analysis were elapsed train running times over each of the DRR's line segments, and train transit times (used to develop locomotive and car hours and train-crew counts) over the portion of the DRR system used by each train during the peak seven days of the ten-day period modeled by DuPont's operating experts. A schematic diagram of the DRR's tracks as they appear in the RTC Model is attached as Exhibit III-C-6. The electronic files containing the RTC Model runs, output and case files are included in DuPont's Part III-C e-workpaper folder "RTC."[15]

As the Board has acknowledged, the SAC test must be equally workable in the Eastern and Western contexts.[16] The same holds true with regard to variances in the amount and usability of railroad traffic and operating data in a given proceeding. Accommodating both the nature of Class I rail operations in the East generally, and the NS traffic data produced in discovery in particular, the RTC simulation of the DRR's operations in the peak week of its peak traffic year confirm that the DRR's configuration, facilities and operating plan are feasible. The DRR's trains operate in a manner that produces faster train speeds and transit times on average than NS demonstrated in the Base Year. The DRR's ability to provide service equal to or better than NS', and thus commensurate with its customers' requirements, therefore is confirmed.

3. <u>Other</u>

a. <u>Rerouted Traffic</u>

It is well established that in stand-alone cost proceedings, Complainants are permitted the flexibility to design and route traffic differently than the actual operations of the defendant

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[15] DuPont understands that the Board's staff is a licensee of, and has, the RTC Model, so the RTC Model itself is not being provided to the Board. Messrs. Fapp and Humphrey used Version 64(G) of the RTC Model for the simulation of the DRR's peak-period operations presented in e-workpaper folder "RTC."

[16] *See CP&L* at 17.

railroad.[17] In this proceeding, to rationalize NS' system and to create a more efficient railroad, DuPont's experts have not constructed all of NS' parallel routes and instead have determined to include existing rail lines which best serve the DRR's customers while minimizing, if not eliminating, duplicate routes. As a result, some traffic is re-routed over a different route than used by NS for moving the traffic. The STB has categorized re-routed traffic as either an "internal re-route" or and "external re-route," where the traffic moves between two points on the actual route of movement over routes that are not the same as those used by the defendant.

An internal re-route is where the movement is originated by the SARR (or interline received by the SARR) at a location on the actual route of movement and then terminated by the SARR (or interline forwarded back to the incumbent carrier) at a location on the actual route of movement. The SARR is free to move the traffic in any way it deems efficient between the two points on the actual route. Note, however, that if the SARR moves the traffic over track that is not on the actual route of movement, the SARR must meet or exceed the service criteria (e.g., transit time) currently realized by the incumbent carrier between the two points on the actual route.

An external re-route is a re-route where the movement is originated by the SARR (or interline received by the SARR) at a location on the actual route of movement and then interline forwarded back to the incumbent carrier by the SARR at a location NOT on the actual route of movement. For an external re-route, the SARR is responsible for any costs incurred by the incumbent carrier as a result of having to move the re-routed traffic over track not normally used to handle the traffic. Examples of such costs would be capacity enhancements, e.g., passing sidings and enhanced signaling systems.

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[17] *See*, e.g., *AEPCO* at 15.

DuPont's experts have re-routed traffic in four instances. Each of these reroutes are "internal reroutes" and are discussed below.

i. Bannon, OH to Kellysville, WV -- NS currently has two routes between Columbus, OH and Kellysville, WV. One extends through Dickinson and Elmore, WV and serves the DuPont facility in Bent,WV. The other route extends through Chillicothe, OH, and Kenova, WV to Kellysville. The DRR does not include the Kenova route and reroutes general freight and coal traffic over the Dickinson/Elmore line. Intermodal traffic is not rerouted over the Dickinson/Elmore line because of curve restrictions on the line. The route miles for the two lines is nearly identical with the Dickinson/Elmore route equal to 323.0 miles and the Kenova route equal to 323.3 miles.

ii. Riverton, VA to Altavista, VA – NS currently has two routes between Riverton, VA and Altavista, VA. The route included in the DRR network extends south from Riverton through Shenandoah and Roanoke, then east to Altavista. NS' alternative route extends east of Riverton to Manassas Jct, VA then south through Charlottesville and Lynchburg, VA to Altavista. The Shenandoah/Roanoke route included in the DRR network is 224.6 miles compared to the Charlottesville/Lynchburg route which equals 216.3 miles or 8.3 miles fewer than the route included in the DRR network. Traffic which NS operates over the Charlottesville/Lynchburg route, which does not originate or terminate on that route is rerouted over the DRR between Riverton and Altavista.

iii. Roanoke, VA to Abilene Cross, VA – NS has two routes between Roanoke and Abilene Cross, VA. The route included in the DRR network extends east through Altavista, VA and Vabrook, VA then to Petersburg, VA a distance of 99.8 miles. NS' alternative route extends northeast through Lynchburg, VA then through Appomattox, VA a distance of 104.1 miles. Traffic which operates over the Lynchburg/Appomattox route which does not originate or terminate on that route is rerouted between Roanoke and Petersburg over the DRR through Altavista.

iv. Green, GA to Bremen, GA – NS has two routes between Green, GA and Bremen, GA. The route included in the DRR network extends from Green south through Austell, GA (just west of Atlanta), then west to Bremen, a distance of 76.8 miles. NS' alternate route also extends south from Green and turns southwesterly then through Cedartown, GA to Bremen, a distance of 38.7 miles or 38.1 miles less than the route included in the DRR. DuPont did not include this duplicate route in the DRR network as it added an unnecessary 38.1 miles of track infrastructure to the system and because the route included in the system is the most direct route to Atlanta and points east and south of Atlanta. Traffic which NS actually moves over the Green/Cedartown route to Bremen does not originate or terminate on this line and moves beyond Bremen. This traffic has been rerouted via the DRR Austell route. {

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In conclusion, the DRR is more efficient than NS in that elimination of the duplicate routes reduces the DRR network by a total of 682.4 route miles or approximately $2.242 billion in road property assets, without any substantial change in service to the DRR's customers from that currently provided by NS.

b. Train Control and Communications

The DRR network employs a Positive Train Control ("PTC") system for all train control and communications. The Rail Safety Improvement Act of 2008 (RSIA) (signed by the President on October 16, 2008, as Public Law 110-432) has mandated the widespread installation of PTC systems by December 2015.

As stated by the Federal Railroad Administration, "PTC systems are integrated command, control, communications, and information systems for controlling train movements with safety, security, precision, and efficiency. PTC systems will improve railroad safety by significantly reducing the probability of collisions between trains, casualties to roadway workers and damage to their equipment, and over speed accidents.... PTC systems are comprised of digital data link communications networks, continuous and accurate positioning systems such as NDGPS, on-board computers with digitized maps on locomotives and maintenance-of-way equipment, in-cab displays, throttle-brake interfaces on locomotives, wayside interface units at switches and wayside detectors, and control center computers and displays.... PTC systems issue movement authorities to train and maintenance-of-way crews, track the location of the trains and maintenance-of-way vehicles, have the ability to automatically enforce movement authorities, and continually update operating data systems with information on the location of trains, locomotives, cars, and crews. The remote intervention capability of PTC will permit the control center to stop a train should the locomotive crew be incapacitated. In addition to providing a greater level of safety and security, PTC systems also enable a railroad to run scheduled operations and provide improved running time, greater running time reliability, higher asset utilization, and greater track capacity. They will assist railroads in measuring and managing costs and in improving energy efficiency."[18]

As discussed in Section III-F, unlike existing Class I carriers, the DRR is installing a PTC system from the outset of its construction and investment, rather than converting an existing train communications and control system to a PTC system. As a result, the investment expenditures by the DRR are less than what an existing Class I carrier will incur to achieve the same level of infrastructure.

Moreover, based on discussions with the designer and developer of the RTC simulation model, the dispatch logic of the RTC most closely simulates the communications of a PTC system where there are no active signals within the model. Therefore, in all locations where PTC will be present on the DRR, DuPont has disabled any signal logic.[19]

c. Miscellaneous Aspects of the Operating Plan

As discussed in Part III-A, the DRR includes cross-over traffic in its traffic group. Cross-over traffic as has been included in stand-alone traffic groups in nearly every proceeding since *Nevada Power II*, as is evidenced by the Board's following statement in *PSCo/Xcel*:

> "The use of cross-over traffic to simplify the SAC presentation is well established practice....It enables the SAC analysis to take into account the economies of scale, scope and density that the defendant carrier enjoys over the routes replicated."[20]

Historically, cross-over traffic has been included in situations where the SARR has built rail lines of the incumbent railroad and moves traffic to or from a created interchange with the incumbent. As with other SARR networks, not all of the incumbent rail lines are required to move the issue traffic which results in cross-over traffic. In the instant proceeding some trains

[18] *See* http://www.fra.dot.gov/pages/784.shtml.

[19] The developer of the RTC model has indicated that operating the model with the signal logic turned off closely mimics the expected operations assuming PTC system communications are employed.

[20] *See PSCo/Xcel* at 13-14.

are moved by the SARR on more than one segment between origin and destination, thus creating two "cross-over" interchanges for a single move.

For example, a train moving from Atlanta, GA to Kansas City, MO, currently moves north from Atlanta to Chattanooga, TN, then to Danville, KY and then west through Louisville, KY to East St Louis, IL, then to Moberly, MO and finally onto Kansas City. The line segment between East St. Louis and Moberly is not included in the DRR Network and rather than rerouting this train over the DRR from East St. Louis northeast to Decatur, IL, then southwest to Moberly, MO, the DRR is assumed to interchange forward these trains to NS at East St Louis and then interchange receive these trains from NS at Moberly, for furtherance to Kansas City. These trains continue to be routed in the same manner that NS currently routes them and therefore do not represent "re-routed" traffic, but rather cross-over traffic with two cross-over interchanges.

In addition to the above example, similar operations occur at the following location pairs on the DRR where trains are interchange forwarded to NS, then received in interchange from NS:

1. Chillicothe, OH and PD Junction, WV;
2. Abrams Yard, PA and Reading, PA;
3. Cincinnati, OH and Ft Wayne, IN;
4. Cincinnati, OH and Goshen, IN;
5. Knoxville, TN and Emory Gap, TN;
6. Salisbury, NC and Asheville, NC;
7. Ft Mill, SC and Augusta, GA; and
8. Buffalo, NY and Cleveland, OH.

Trains subject to these operations do not carry issue traffic and are identified in the RTC train lists as trains with the same train identification numbers and start dates, but with "A" and "B" designations, which represent the two different handlings of this train by the DRR.

Other elements of the DRR operating plan are described in Part III-D. These include locomotive maintenance facilities and procedures, equipment maintenance facilities and procedures, and operating personnel requirements – including Train & Engine ("T&E") crews and non-train operating personnel involved in field supervision, yard operations, dispatching, and mechanical functions. As described in Part III-D-5, the DRR's maintenance-of-way plan has been carefully coordinated with its operating plan and is fully consistent with the operating plan.

Part III-D

III. D. OPERATING EXPENSES

This Part of DuPont's Opening Narrative explains the DRR's annual operating expenses for equipment, personnel, general & administrative, information technology and maintenance-of-way requirements and the development of the related service units and costs. The expert witnesses responsible for the evidence in this Part include Richard H. McDonald (locomotive requirements and operating and general and administrative personnel and equipment); Joseph A. Kruzich (information technology costs); Philip H. Burris (operating statistics, crew requirements, locomotive and freight car requirements, fuel costs, personnel compensation, equipment lease/maintenance costs and operating units cost); and Harvey A. Crouch, P.E. (maintenance-of-way costs). Their detailed qualifications are included in Part IV.

DuPont witness Fapp and Humphrey developed train transit/cycle times from the RTC Model simulation of the DRR's operations. The RTC Model output was directly used to calculate the DRR's locomotive hours and car hours for the peak week of the June 1, 2018 to May 31, 2019 peak year. Mr. Burris, using the peak week transit times and locomotive requirement outputs from the RTC model, calculated locomotive hours and car hours for trains moving from June 1, 2009 through May 31, 2010 ("Base Year"). In addition, locomotive unit miles and car miles were calculated for trains moving in the Base Year.[1] The resulting statistics were utilized to determine overall locomotive requirements and car ownership requirements, as shown in the accompanying workpapers.[2] T&E (train crew) personnel requirements were also developed for trains moving in the Base Year.[3]

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[1] Development of the locomotive miles, car miles, locomotive hours, car hours and train and enginement ("T&E") requirements is shown in e-workpaper "Base Year Train List_Statistics_Open.xlsx."

[2] *See* e-workpapers "DRR Operating Statistics.xls" and "DRR Car Cost.xls."

[3] Details are provided in e-workpaper "Base Year Train List_Statistics_Open.xlsx."

The actual locomotive and car hours and associated expenses derived from train transit/cycle times for the year would be lower than those presented here because the average number of daily trains containing DRR traffic moved during the Base Year is less than the daily trains moved by the DRR during the peak one-week period of the peak year. Thus the DRR's transit/cycle times should be faster on a daily average basis for the entire year than as compared to the peak week.

The DRR's Base Year annual operating expenses are shown in Table III-D-1 below.[4]

Table III-D-1
DRR Base Year Operating Expenses

	Expense Component (1)	Cost (in Millions) (2)
1.	Locomotive Lease [Ownership]	$58.2
2.	Locomotive Maintenance	$124.0
3.	Locomotive Operations	$394.0
4.	Railcar Lease	$307.0
5.	Materials & Supply Operating	$3.8
6.	Train and Engine Personnel	$314.0
7.	Operating Managers	$53.7
8.	General & Administrative	$57.6
9.	Loss & Damage	$14.1
10.	Ad Valorem Tax	$56.7
11.	Maintenance-of-Way	$156.6
12.	Trackage Rights	$42.3
13.	Intermodal Lift and Ramp	$97.7
14.	Insurance	$35.1
15.	Startup and Training	$112.4
16.	**Total**[1/]	**$1,827.5**

1/ Total may differ slightly from the sum of the individual items due to rounding.

[4] The DRR's first year of operations is June 1, 2009 through May 31, 2010. Operating expenses are calculated for this first year of operations at 2Q2009 wage and price levels. The DCF model uses these expenses and indexes them to the appropriate time periods.

1. **Locomotives**

The DRR's Base Year locomotive requirements are summarized in Table III-C-4 in Part III-C. The DRR uses three types of locomotives – GE ES44AC locomotives for road service (including helper service), GP38 locomotives for local train service and work trains and EMD SW1500 locomotives for yard switching. The DRR needs a total of 481 ES44AC locomotives and 101 GP38 locomotives to transport its peak year trains (including spares), and a total of 80 SW1500 locomotives for switch service.

a. **Acquisition**

NS did not provide any current locomotive capital leases in response to DuPont's discovery requests. As a result, DuPont developed 2009 locomotive lease costs for ES44AC locomotives from information contained in the STB's decision in *AEPCO*[5] and the public version of defendants' reply statement in that proceeding. The annual lease expense developed from *AEPCO* equals ${ } per unit.[6] This amount is also supported by the public version of UP's Reply evidence in *IPA*[7] which shows that UP's 2011 annual cost to lease ES44AC locomotives equals ${ }.[8] The total DRR lease cost in 2009 for ES44ASC locomotives equals ${ }.[9]

The DRR also leases its GP38 locomotives at an annual lease price of $82,699 per unit. This lease price is developed from an article in the June 2008 issue of *Railway Age*, titled "2008

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5 *See AEPCO* at 40-41.

6 The STB's decision in *AEPCO* provides total investment in locomotives at page 40, and the number of units by type of unit at page 41. Defendants' Reply statement (public version) provides the lease price for switch locomotives at page III.D-3, thereby providing the information necessary to determine UP's average annual lease price for ES44-AC locomotive in 2009. See e-workpaper "III-D-1 Loco Cost.pdf."

7 STB Docket No. 42127, *Intermountain Power Agency v. Union Pacific Railroad Company,* UP Reply at III-D-2 and III-D-8 (Public Version).

8 *See* e-workpaper "Loco Cost.pdf."

9 In addition, to these locomotive lease amounts, capital costs to install required PTC equipment on all ES44AC and GP38 locomotives are included with the signals & communications investment expense in the DCF model. The amount included per locomotive is developed from information provided by NS in discovery.

Guide to Equipment Leasing."[10] The total DRR lease cost in 2009 for GP38 locomotives equals $8.4 million.

The DRR also leases its SW1500 locomotives at an annual lease price of $36,755 per unit. This lease price is also developed from the June 2008 issue of *Railway Age*, titled "2008 Guide to Equipment Leasing."[11] Application of this annual lease payment to the 80 SW1500 locomotives results in an annual lease payment of $2.9 million in 2009.

As explained in Part III-C-1, DuPont's experts used a road locomotive spare margin of { } percent and { } percent for ES44AC and GP38 locomotives, respectively, based on NS's actual experience as shown in materials it produced in discovery. DuPont's experts also applied a peaking factor, as mandated by the Board in *WFA/Basin*, to arrive at the DRR's total annual road locomotive requirements. The peaking factor equals 5.4 percent and is equal to the average number of train starts per day in the peak week of the Peak Year divided by the average number of train starts per day in the Peak Year. This is the same procedure as that used by the STB to calculate the peaking factor in *PSCo/Xcel II*.[12]

b. <u>Maintenance</u>

The DRR's locomotives undergo FRA-required 92-day inspections and minor repairs at each designated DRR yard. The locomotives are maintained primarily at Elkhart, Conway, Chattanooga and Roanoke yards, where the DRR has provided a locomotive maintenance facility to be used by its locomotive maintenance contractor. Locomotives used for trains that do not operate through one of these locations or any other locomotive inspection/maintenance point on

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[10] The lease price for GP38-2 and GP38-3 locomotives range from $200 to $250 per day, indexed to 2Q2009 using the AAR equipment rents index produces an annual lease rate of $82,700.

[11] *See* e-workpaper "III-D-1 Loco Cost.pdf." The lease price for SW1500 locomotives ranges from $75 to $125 per day. Using the average price of $100 per day, indexed to 2009 using the AAR equipment rents index, produces an annual lease payment of $36,755 per unit.

[12] *See PSCo/Xcel II* at 13.

NS (in the case of cross-over traffic) are routed on trains that do operate through one of the yards with a locomotive maintenance facility, as necessary, to enable them to receive required maintenance, including periodic overhauls.

NS' 2009 average locomotive maintenance cost per locomotive unit mile is used for ES44AC, GP38 and SW1500 locomotives. The NS cost per locomotive unit mile of $1.1795 was developed from its 2009 R-1 Annual Report to the STB and indexed to 2Q09.[13] The NS system average cost includes both routine maintenance and locomotive overhauls. The system average cost was used as NS failed to provide information requested in discovery that is specific to various types of locomotives it utilizes including ES44AC and GP38 locomotives. The total locomotive maintenance cost for the DRR equals $124.0 million in 2009.[14]

The DRR provides an End-of-Train Device ("EOTD") for each of its locomotives.[15]

c. **Servicing (Fuel, Sand and Lubrication)**

Contractors based at the DRR's yards fuel, sand and lubricate locomotives. Locomotives are fueled and serviced using two different procedures. First, inspections of through trains moving more than 750 miles on the DRR occur at Elkhart, Conway, Roanoke, Chattanooga, Atlanta and Bellevue. Fixed fueling platforms are located at each of these locations for fueling and servicing locomotives. Locomotives on through trains that are being inspected are removed and replaced with freshly fueled and serviced locomotives. Further, locomotives on trains originating at these locations are also fueled and serviced at the fueling platforms. Second, locomotives originating at locations other than those listed above are fueled by contractors using tanker trucks (known in the railroad industry as direct-to-locomotive or "DTL" fueling).

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[13] *See* e-workpaper "Loco Servicing and Maintenance Cost.xlsx."

[14] *See* e-workpapers "DRR Operating Expense.xls"

[15] *See* e-workpaper "DRR Materials and Supplies.xls."

The DRR's fuel cost is based on the average consumption per per locomotive unit mile calculated from NS' 2009 R-1 Annual Report for road and yard locomotives and the actual price of fuel paid by NS for 2Q2009 as reported by NS in its Quarterly Review. The components of the DRR's fuel costs are discussed below.

i. <u>Fuel Cost</u>

The DRR's fuel cost is based on the price NS paid for fuel in 2Q2009 of $1.545 per gallon as reported in NS' Quarterly Financial Review, Second Quarter 2009.[16]

ii. <u>Fuel Consumption</u>

The average fuel consumption rate for the DRR was developed from NS' 2009 R-1 Annual Report. For road and switch locomotives this equals to 2.28 and 2.67 gallons per locomotive unit mile respectively.[17]

iii. <u>Locomotive Servicing</u>

Other DRR locomotive servicing costs (primarily sand and lubrication) are based on a cost of $0.2198 per diesel unit-mile for ES44AC and GP38 locomotives and $0.0602 for SW1500 locomotives. These amounts are calculated using NS's 2009 R-1.[18]

2. <u>Railcars</u>

a. <u>Acquisition</u>

The DRR uses a mixture of railroad-provided cars and private cars. For railroad-provided cars, DuPont developed car costs using three different approaches. First, for non-coal traffic moving in cars owned by foreign roads, car costs are based on time and mileage by car type developed from NS's 2009 R-1.

Second, for non-coal traffic moving in NS equipment, an annual full service lease cost

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[16] *See* www.nscorp.com/nscorpjtml/pdf/financial-q2-09.pdf and e-workpaper "Loco Cost.pdf."

[17] *See* e-workpaper "Loco Cost.pdf."

[18] *See* e-workpaper "Loco Servicing and Maintenance Cost.xls."

was developed for each car type from information provided by NS in discovery or from publicly available sources.[19] A weighted annual car cost for all car types was then developed based on the percentage each car type moves on the DRR system. The weighted average annual car cost was then converted to a cost per hour and cost per mile and applied to the car hours and car miles for the Base Year trains. The car hour requirements for these cars are based on RTC transit times, plus free time at shipper origin and destination. The free time included is based on review of NS Tariff NS 6004-C, *Demurrage Rules and Charges,* effective February 1, 2009.[20] This tariff specifies NS demurrage charges equal to $100 per car per day, or fraction thereof and provides for a one day credit for loading and a two day credit for unloading. These credit days are included in the calculation of car days for the purpose of determining DRR system car requirements. Time beyond the credit days at origin and destination are not included as NS collects $100 per car per day for that time. Given that the typical car leases for between $8.00 and $15.00 per day,[21] the $100 charge received by NS, and which would be received by DRR, more than offsets any additional car costs the DRR would incur for system cars at origin or destination. Third, for DRR-provided coal cars, car lease payments are based on annual full service lease costs developed from an article in the June 2008 issue of *Railway* Age, titled "2008 Guide to Equipment Leasing." The annual full service lease for coal cars is $5,232.[22]

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[19] *See* e-workpapers "III-D-2 Car Cost.pdf" and "DRR Car Costs.xls."

[20] A copy of NS Tariff 6004 – C is included, *See* e-workpaper "III-D-2 Car Cost.pdf"

[21] Annual lease cost of $3,024 and $5,340 divided by 365 days, respectively.

[22] *See* e-workpaper "III-D-2 Car Lease Cost.pdf." and DRR Car Costs.xls."

The cars provided by the DRR for non-coal traffic include boxcars, covered hoppers, gondolas, open-top hoppers and flat cars. The annual full service lease cost per car for each car type is as follows:

Boxcars	$3,024
Covered Hoppers	$3,576
Open-top Hoppers	$5,232
Flat Cars	$5,340

The lease costs for these car types are based on *Railway Age's* "2008 Guide to Equipment Leasing".[23]

The DRR's freight car requirements include a spare margin of { } percent. This spare margin is based on a review of transportation contracts provided by NS in discovery which show spare margins that range from { } percent to { } percent. This spare margin is similar to the 5.0 percent spare margin used by both parties and accepted by the Board in *AEPCO* at 46. A 5.0 percent margin was also accepted by the Board in *Otter Tail.*[24]

b. Maintenance

As described above, the DRR uses full service car leases for the railcars it provides. As full service lease payments include maintenance costs, no other maintenance costs are included.

Shippers who supply railcars for their DRR movements make their own separate arrangements for maintenance of their cars at existing car repair facilities on or near the route of movement.

c. Private Car Allowances

For DRR coal movements that occur in private cars, the cars are provided per diem and mileage free under the terms of the relevant NS transportation contracts and other pricing authorities (that is, the cars are provided free of charge to NS and the freight rates reflect the fact

[23] *Id.*

[24] *Otter Tail* at C-5.

that NS is not incurring car costs). Because the DRR is replacing NS with respect to its coal traffic, the DRR also pays no per diem or mileage allowances with respect to coal movements in private cars.

With respect to private cars used for non-coal traffic, DuPont's experts have included a private car charge per car-mile by car type which is applied to all private car-miles on the DRR. The private car mileage charge by car type was developed from data contained in NS's 2009 R-1.[25]

3. Operating Personnel

The DRR has a traffic group that moves primarily in trainload quantities. Consistent with the stand-alone concept of identifying the least-cost, most-efficient, feasible hypothetical alternative to the incumbent, the DRR is a non-union railroad that is built from the ground-up to handle a defined traffic group.[26]

DuPont's experts have developed a staffing plan and associated personnel for the DRR to handle its projected peak traffic volume safely and efficiently by taking full advantage of modern technology. This staffing plan also permits the railroad to maintain its facilities in good condition while minimizing cost.

The DRR's operating personnel include train crew, line supervisory and field employees in Transportation, Engineering/Maintenance-of-Way and Mechanical departments. The senior Operations staff (headquartered at Roanoke, VA) report directly to the Vice Presidents of Transportation, Engineering and Mechanical, in turn each of these Vice Presidents reports to the Vice President -- Operations. The DRR's operating personnel requirements are summarized below and fully discussed in Exhibit III-D-1.

[25] *See* e-workpaper "DRR Car Costs.xls."

[26] The Board has accepted the concept of a non-unionized SARR. *See TMPA* at 687; *PSCo/Xcel* at 68, 69.

a. Train/Switch Crew Personnel

The DRR requires a total of 3,166 Train & Engine ("T&E") crew members to transport its Base Year trains. This count, which includes helper crews and switch crews based at the DRR's yards, is based on the number of trains moving over the various parts of the DRR system during the Base Year; the crew assignments developed by Mr. McDonald (as described in Part III-C-1-d), and the switch assignments at the DRR's yards. The RTC Model simulation performed by Mr. Fapp was used to confirm that train crews operating in these crew districts generally could complete each tour of duty within 12 hours and otherwise comply with the federal Hours of Service law, as amended.[27]

Consistent with Board precedent, T&E crews were developed using the total number of crew starts as determined by the actual train counts over an entire year.[28] In this instance, crews were determined for all trains moving in the Base Year. The total crew starts from each crew base were then adjusted upward to reflect the 0.38 percent re-crewing requirements based on the results of the RTC simulation indicating the number of crews whose on-duty time expired under the Hours of Service law. The adjusted crew count was then used to determine the total number of T&E crews required using the standard formula employed by the Board to determine how many crews are required to cover the number of crew starts assuming that each crew member is available 270 days a year. *Id.*[29]

b. Non-Train Operating Personnel

The DRR's staffing requirements for operating personnel other than train and switch crews and maintenance-of-way ("MOW") personnel are organized into three departments all reporting to the Vice President – Operations. The 591 non-train operating DRR personnel are

[27] *See* e-workpaper "Base Year Train List_Statistics_Open.xlsx."

[28] *See PSCo/Xcel* at 62.

[29] This number is not affected by the hours-of-service provisions of RSIA.

summarized by department in Table III-D-2 below and fully discussed in Exhibit III-D-1. MOW personnel are discussed separately in Part III-D-5.

Table III-D-2
DRR Non-Train Operating Personnel

Operations Department Position (1)	No. of Employees (2)
Vice President Operations Office	20
1. Transportation Department	281
2. Mechanical Department	286
3. Engineering Department	4
4. Total Non-Train Operating Personnel	591

c. Compensation

Compensation for the T&E personnel and other non-train operating personnel is derived from NS's 2009 Wage Forms A&B and is established at the same levels as those paid by NS for comparable positions. The T&E wages include all constructive allowances paid by NS to its train and enginemen. The total compensation for T&E personnel equals ${ }. Total compensation for DRR's non-train operating personnel equals $39.0 million. Salaries and total compensation for the DRR's T&E personnel and for the non-train operating personnel are shown in detail in Exhibit III-D-1.

Fringe benefits for all DRR employees are based on 37.5 percent of wages. This number is based on the average ratio of fringe benefits to total wages paid in 2009 to all railroad operating employees in the states in which the DRR operates, as reported by the Association of American Railroads.[30] This method of determining the fringe benefit ratio has been approved by

[30] Historically, the AAR reported fringe benefit information on a state by state basis for operating employees, it now reports fringe benefit information only for the US as a whole.

the Board.[31] In addition, it is the same method used by Complainants and accepted by both Defendants and the Board in *AEPCO*.[32]

d. <u>Taxi and Hotel Expense</u>

The DRR also incurs taxi and overnight expenses for train crews. The number of taxi trips required, the cost per trip, the number of overnight stays and the cost per stay were identified for each crew.[33]

Consistent with Board precedent, taxi trips and overnight stays were developed using the actual train counts (and the crews' related taxi and hotel requirements) over an entire year.[34]

The DRR's unit cost for taxi trips is estimated based on current rates for taxi service at each location. The cost per overnight stay ranges from $29.99 to $89.95 and is based on hotel room rates throughout the DRR system.[35]

e. <u>Materials, Supplies and Equipment</u>

Materials, supplies and equipment for operating personnel (other than maintenance-of-way personnel) include office furniture and equipment, office supplies, safety equipment, EOTDs, motor vehicles including railcar inspection vehicles, and tools and supplies. The total annual operating expense for these items equals $3.8 million in the base year.[36]

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[31] *See WFA/Basin* at 66.

[32] The Public Version of AEPCO's Opening Evidence shows the derivation of the fringe benefit ratio in that proceeding, see AEPCO's January 25, 2010 Opening Evidence, Public Version, page III-D-25. Review of Defendants Reply evidence shows that they did not object to this fringe benefit ratio. *see* Defendants Reply Evidence dated May 7, 2010, pp. III.D-29 to 30. Moreover the STB accepted this evidence without comment in *AEPCO*.

[33] *See* e-workpaper "DRR_Overnight Hotel and Taxi Costs.xlsx."

[34] *See WFA/Basin* at 48 and *PSCo/Xcel* at 69.

[35] *See* e-workpaper "DRR Overnight and Taxi Cost.xlsx."

[36] *See* e-workpaper "DRR Materials and Supplies.xls."

4. General and Administrative Expense

The DRR's personnel have all been designated as operating personnel or as General & Administrative ("G&A") personnel. The maintenance-of-way employees, while considered operating personnel, are discussed separately in Exhibit III-D-3. Those employees who might be considered non-operating personnel on a Class I railroad are all included in the G&A staff discussed below.

The G&A expenses for the DRR include its headquarters (corporate) management and administrative staff, buildings and equipment, and other expenses, including information technology ("IT") requirements. These expenses have been developed on the basis of the experience of DuPont's Witnesses McDonald, Burris and Kruzich. Mr. McDonald in particular has held a number of senior management positions at a Class I railroads. Mr. Burris developed G&A personnel salaries based on salaries paid to comparable NS or (where appropriate) other railroad personnel. DuPont's IT expert, Joseph Kruzich, developed the DRR's IT requirements and costs including computer hardware, systems, software, and support personnel as well as out-sourcing needs.

The DRR's engineering staff was developed by DuPont's engineering witness, Harvey Crouch, in consultation with Mr. McDonald. As the engineering function principally involves maintenance-of-way, the DRR's engineering personnel are discussed below in Part III-D-5.

a. Staffing Requirements

The DRR's G&A staff is consistent with the G&A staffing for the SARRs approved by the Board in recent SAC cases, including *PSCo/Xcel*, *AEP Texas*, *WFA/Basin* and *AEPCO*, taking into account the DRR's larger geographic scope, traffic volumes and train flows, and the diversity of commodities handled. It should be noted, however, that many G&A functions do not vary with the number of route-miles or the traffic volume. The nature of most G&A functions means that a railroad the size of the DRR can achieve greater staffing economies of scale than a small railroad.

The G&A staff is based at Roanoke, VA, where the DRR's corporate headquarters building is located. This staff covers all executive and administrative functions including marketing, legal services, accounting and bookkeeping, budgeting, financial reporting, payroll, information systems, human resources, secretarial and clerical services, and supervising contractors in the performance of some out-sourced functions.

The DRR's G&A staff is summarized in Table III-D-3 below by department. This table does not include the operating and MOW employees located at the Roanoke, VA headquarters, who are discussed elsewhere in this Part. The G&A personnel requirements by department are fully discussed in Exhibit III-D-2.

Table III-D-3
DRR General & Administrative Personnel Requirements

Position (1)	Personnel (2)
1. Executive Dept. Total	9
2. Marketing Dept. Total	50
3. Finance & Accounting Dept. Total	66
4. Legal & Administration Total	42
5. IT Total	46
6. Total General & Administrative	213

Source: Exhibit III-D-2

i. Executive Department

The DRR's Executive department consists of the President's Office, as well as the DRR's Board of Directors. The President's office consists of nine (9) people: the President, two Directors of Corporate Relations, an Administrative Assistant and five (5) outside directors. The DRR has a ten-person Board of Directors, with five inside and five outside directors.

ii. Traffic and Marketing Department

The DRR Traffic and Marketing Department consists of 50 people and is headed by the Vice President – Traffic, who is assisted by the Director of Marketing and Sales and the Director of Customer Service. The Traffic and Marketing Department is responsible for the DRR's marketing functions, including communications with the railroad's customers and monitoring train locations and maintaining contact with customers regarding their shipments.

iii. Finance and Accounting Department

The Finance and Accounting Department is responsible for the DRR's basic financial and accounting functions, including treasury, taxation, revenue collection, disbursements for accounts payable, financial reporting, and budgeting and analysis. It consists of 66 employees and is headed by the Vice President – Finance & Accounting who (like the other vice presidents) has an Administrative Assistant/Secretary. The department has a Treasurer, a Controller, a Director of Budgets and Purchasing, a Director of Cost Analysis and a Director of Internal Auditing with various support positions reporting to these sub-department heads. The Vice President – Finance & Accounting is also the DRR's Chief Financial Officer.

iv. Law and Administration Department

The Law and Administration Department consists of 42 employees. It is headed by the Vice President – Law and Administration (with assistance from an Administrative Assistant) who is responsible for the DRR's legal affairs including litigation control, risk management and claims, and regulatory compliance. This Vice President is also responsible for other administrative functions including, real estate, claims, security and human resources and training.

v. **Information Technology Department**

The DRR's IT systems and associated personnel were developed by DuPont Witness Kruzich, who has considerable experience with the IT function at Class I and other railroads. The IT system (described in section 4.d) is administered by a staff consisting of a Vice President Information Technology, three Directors of Information Technology and 42 IT Specialists. As discussed in more detail in Exhibit III-D-2, the DRR does not have a main-frame environment, but rather a NT/PC-based system. This means far less IT effort is required than a typical Class I railroad due to the relative simplicity of a NT/PC-based system and the fact that much of the IT requirements is outsourced to RMI (i.e., Transportation, Revenue, Intermodal and Car Hire functions).

b. **Compensation**

The salaries and benefits for the DRR's G&A personnel described above are based on comparable and competitive compensation packages presently available in the railroad industry (and in other service industries).

Specifically, annual salaries for the G&A personnel are based on data contained in NS's Wage Forms A and B, with several exceptions. Salaries for the President and the Vice Presidents included in the G&A staff are based on the salaries, including bonuses, paid for similar positions by the Kansas City Southern Lines ("KCS") a holding company which owns and operates the Kansas City Southern Railway, the Kansas City Southern de Mexico and the Texas Mexican Railway Company. According to the KCS' website, the three major lines comprising the KCS operate 7,075 route miles of railroad, which is nearly the same as the 8,023 route miles operated by the DRR. This is far smaller than NS which operates 20,623 miles and substantially smaller than the other Class I railroads.

As stated previously, fringe benefits for all employees are based on 37.5 percent of wages based on information available from the AAR for railroads operating in the states where the DRR is located. The fringe benefit ratio includes expenses related to health and welfare benefits, railroad retirement, supplemental annuities, unemployment insurance and other programs.

The total compensation for the DRR G&A employees equals $19.1 million. This compensation by employee is addressed in Exhibit III-D-2.

c. Materials, Supplies and Equipment

Consistent with the stand-alone principles of unlimited resources and barrier-free entry, the ready availability of materials and equipment is assumed.

The DRR owns or leases various types of vehicles and equipment used by its Operating and G&A staffs. As fully discussed in Exhibit III-D-3,2 costs for this equipment are included in the calculation of the DRR's annual operating expenses.[37]

The DRR also needs miscellaneous office equipment and supplies including desks and janitorial supplies.[38]

d. Other G&A Expense

i. IT Systems

The DRR's information technology systems have been developed by DuPont Witness Joseph Kruzich, its experienced railroad IT expert. Mr. Kruzich has worked for Class I railroads reviewing various work procedures and providing recommendations on how the work processes could be improved to achieve a high degree of efficiency. This position provided him an opportunity to become very familiar with various work processes involved in running a railroad. Mr. Kruzich also served as IT Vice President of the Kansas City Southern Railroad and was

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[37] *See* e-workpapers "DRR Operating Expense.xls" and "DRR Materials and Supplies.xls".

[38] *See* e-workpaper "DRR Materials and Supplies.xls."

instrumental in directing the development of KCS new computer systems in the late 1990's. A more detailed description of Mr. Kruzich's qualifications is contained in Part IV of this opening evidence.

Mr. Kruzich reviewed the DRR's operating plan and G&A requirements to determine the railroad's basic computer and communications needs and the kind of support needed by its staff. The IT systems described below enable the DRR to operate safely and efficiently and to perform all administrative functions.

The DRR has an average of 758 train movements per day in the peak week, as well as a limited number of local customers and interchange points. It also handles primarily trainload movements, with multiple-car billing (using the RMI Revenue System to allocate revenues), rather than billing for individual railcars. This reduces the complexity of the computer and communication systems required to support operations, and renders unnecessary the colossally expensive mainframe systems that large carriers such as NS use. Based on the DRR operating plan and G&A staff departments, the capital requirements for IT and communications systems equal $10.7 million.[39] The annual operating cost for IT and related communications equals $25.6 million at 2009 price levels.[40] Table III-D-4 below shows the capital and annual operating expenses separately for information technology and related communications systems.

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[39] *See* e-workpaper "DRR-Capital Budget.xls."

[40] *See* e-workpaper "DRR-Operating Budget.xls."

Table III-D-4
Capital And Operating Costs For
DRR IT And Communications Systems

Item (1)	Capital Cost (2)	Operating Expense (3)
1. Information Technology	$10,624,960	$24,883,951
2. Communications	$67,168	$760,338
3. Total	**$10,692,128**	**$25,644,290**

Source: *See* e-workpapers "DRR-Capital Budget.xls" and "DRR-Operating Budget.xls"

The DRR's computer and IT communications systems are fully described in Exhibit III-D-2. They have been designed to meet the company's mission-critical technology needs to achieve operating efficiencies, customer satisfaction, optimum staffing,[41] maximum productivity, and safe train operations. The costs shown in the workpapers are based on the DRR's highest daily train counts and number of annual carload transactions.

In addition to the amounts shown above for IT capital, costs for IT hardware and software are included in the signals and communications investment account that are required for the DRR's PTC signaling system. The amount included is based on values provided by NS in discovery for additional IT systems and prorated to the DRR based on a route mile basis. The amount provided was reduced to eliminated duplication of the dispatching system already provided for in the IT capital cost reflected above.

ii. Other Out-Sourced Functions

As described earlier, several functions customarily provided in-house by large Class I railroads can be efficiently out-sourced by the DRR. Consistent with the stand-alone concept of

[41] The DRR's IT personnel requirements are described above in the discussion of G&A personnel. The IT staff size is largely a function of the systems described in this section.

an efficient, least-cost railroad, out-sourcing is used wherever the economics so justify without sacrificing the SARR's feasibility or service quality.

Out-sourced functions, in addition to those described in the preceding section, include initial training of operating employees (discussed in more detail below), several finance and accounting functions, including preparation of income, property and payroll tax returns and financial/account auditing, legal services, including claims administration and investigation, and administration of the company's retirement plan.[42]

A number of independent accounting, payroll service and other firms have the experience and systems to perform these functions. For example, the payroll service firm Paychex has experience in complying with Railroad Retirement and other railroad-specific tax and regulatory reporting requirements. In the human resources area, regional and industry employers' associations are available as a resource for the DRR's internal human resources staff.

Estimated annual costs of $2.1 million have been developed for outsourcing all of the functions described above.[43]

iii. Start-Up and Training Costs

The DRR's start-up and training costs have been calculated using the procedures approved by the Board in *WFA/Basin* at 51-54. A total amount of $112.4 million has been provided for initial DRR training and recruiting costs.[44] Consistent with *WFA/Basin*, start-up training and recruitment costs are treated as operating expense in the DRR's first year of operations. Training and recruiting costs are fully discussed by position in Exhibit III-D-2.

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[42] *See* e-workpaper "DRR GA Outsourcing.xls."

[43] Id.

[44] *See* e-workpaper "DRR Operating Expense.xls," tab "Training."

iv. Travel Expense

Travel expenses have been included for all DRR employees at the Manager level and higher (except for the Customer Service Managers and the Assistant Controllers, as these positions do not require travel) and for the five (5) outside members of the Board of Directors. Annual travel expenses of $9,751 per employee are included. This amount is based on the 2009 annual survey of corporate travel managers performed by Runzheimer International, which estimates the annual cost of corporate business travel.[45] The DRR's other start-up costs, road property investment costs including construction of fixed facilities, which are included in the DRR's capital costs, and equipment acquisition are discussed in other sections of Part III.

5. Maintenance-of-Way

The MOW plan for the DRR was developed by DuPont's expert railroad engineering witness, Harvey Crouch.[46] It was also reviewed and approved by Richard McDonald, DuPont's rail operations expert, who has engineering and operating experience with NS's predecessors.

Mr. Crouch served in the Southern Railway's and then NS's Engineering Department from 1977 to 1987, including service as a Project Engineer and Track Supervisor in the Maintenance of Way & Structures Department. His duties in these positions are detailed in his Statement of Qualifications in Part IV. As Track Supervisor, Mr. Crouch was responsible for the inspection and maintenance of a portion of NS's mainline trackage in Virginia, including track inspection, day-to-day supervision of work gangs, ordering material, budgeting and planning, as well as management of rehabilitation and maintenance of track and inspection of bridges. As Project Engineer, Mr. Crouch was responsible for engineering design and plan review, and the

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[45] *See* e-workpapers "DRR Operating Expense.xls" and "III-D-3 Material and Supplies.pdf."

[46] Mr. Crouch is also sponsoring DuPont's evidence on the DRR's construction costs in Part III-F below. The staffing for the DRR's MOW Communications & Signals Department is also sponsored by DuPont's communications and signals expert, Victor Grappone, PE.

bid and construction engineering phases for major capital track and bridge construction and rehabilitation projects in the geographic areas served by the DRR.

Mr. Crouch considered the kinds of terrain and climate in which the various portions of the DRR are located in developing the DRR's MOW plan and incorporated the significant aspects of the variations in terrain and climate into the MOW plan and staffing.

Consistent with *WFA/Basin*, Mr. Crouch's MOW plan has a substantial field staff to perform day-to-day inspection and maintenance activities, supported by a managerial/office engineering and support staff that reports to the DRR's Vice President-Engineering & Mechanical. Capital maintenance programs are also required during the 10-year DCF period to renew/replace the fixed facilities and in particular the principal elements of the track structure. The DRR's MOW staff has been structured to include planning, budgeting and contracting related to annual capital programs.

Also consistent with *WFA/Basin*, all of the DRR's program work (including rail grinding and crossing paving) is performed by contractors. It is more efficient to contract out program work, rather than hiring large seasonal gangs to perform most of this work as most Class I railroads have done until recently.[47] Using contractors is more efficient, in part, because contractors are not subject to internal railroad union craft work-rules (which can be exacerbated for large railroads like NS that are the product of numerous mergers and consolidations among predecessor railroads) or the Railroad Retirement program, which makes internal railroad labor very expensive. In addition, it is not cost-effective to hire and equip large mechanized gangs consisting of DRR employees because most program work is performed on an as-needed basis

[47] Consistent with the treatment of program renewal work in other rate cases such as *AEP Texas* and *WFA/Basin*, the cost of capital programs is accounted for in the DCF model. In addition, CSX uses Hulcher for ballast train supply and unloading; all the Class 1's use contractors for vegetation control, rail defect testing, geometry car testing, and to some extent, inspection using hy-rail truck mounted equipment. Regional and Short Line Railroads routinely use contract services for all capital work.

each year, and gangs simply are not needed throughout the entire year. In addition, winter work is not feasible on parts of the DRR due to roadbed freezing and ballast delivered in ballast cars freezing en route to construction areas.[48]

In developing the DRR's MOW plan, Mr. Crouch started by considering the maintenance functions that need to be performed, and then developed an appropriate field organization and supervisory/support staff for each function, given the railroad's geographic scope, terrain, number of trains and gross tonnages. The basic functions include track inspection and routine maintenance, communication and signal inspections, testing and maintenance, bridge inspection and minor building maintenance, and budgeting and administrative support. Mr. Crouch also considered the equipment needs for each function, as well as the maintenance work (other than capital program maintenance) that appropriately could be contracted out. The total MOW expense in the Base Year equals $156.6 million.

Each of the categories of MOW expense is discussed at length in Exhibit III-D-3. This Exhibit also addresses program maintenance and maintenance scheduling. The detailed calculations are provided in Mr. Crouch's supporting e-workpapers.

6. <u>Leased Facilities</u>

The DRR 32 joint facility agreements cover 818 route miles throughout its system. The development of the annual payments to NS and other carriers for use of these trackage rights is shown in the workpapers included with this opening evidence.[49]

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[48] Because the DRR starts operations with a newly-constructed physical plant, there should be no need for significant program work (and thus large mechanized forces) during the first 10 years of its operations – notwithstanding the way program maintenance is treated under the DCF model, in which a portion of the DRR's fixed assets are assumed to be renewed each year.

[49] *See* e-workpaper "DuPont Joint facility charges.xlsx."

7. Loss and Damage

The DRR's annual loss and damage cost equals $14.1 million. This cost was developed based on NS's actual 2010 loss and damage per ton for the commodities moving on the DRR multiplied by the number of tons of each commodity moved on the DRR in 2010.[50] This is the same methodology used to calculate loss and damage costs in other SAC proceedings by both Complainant and Defendant and accepted by the Board. Review of the public record shows that most recently, Complaintant used this method in the AEPCO proceeding, it was accepted by Defendants in that proceeding and without comment by the Board in *AEPCO*.

8. Insurance

The standard practice of large railroads is to self-insure against potential liability except for catastrophic risks. The DRR also self-insures for most types of claims, and obtains insurance at competitive rates to cover catastrophic loss and Federal Employers Liability Act exposure.

Insurance expenses for the DRR were calculated using NS's 2009 insurance ratio of 1.96 percent of operating expenses.[51]

9. Ad Valorem Taxes

The DRR operates in the states of Alabama, Delaware, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia and West Virginia. To develop ad valorem taxes, the amount of tax that NS paid per route mile was calculated for NS's route miles in each state. These amounts were then applied to the DRR's route miles in each state and summed to arrive at DRR's total Ad Valorem Tax burden.

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[50] For cross-over traffic, the DRR's share of the loss and damage payments was calculated on the percentage of the DRR's car-miles to NS's total car-miles by two-digit STCC code. *See* e-workpaper "DRR Loss and Damage.xls."

[51] *See* e-workpaper "NS Insurance Rate.xls."

10. Other

a. Intermodal Lift and Ramp Cost

In addition to the line haul costs associated with intermodal traffic related to locomotives, fuel, crews and maintenance-of-way, the DRR incurs lift and ramp costs. These costs have been included for all containers and trailers originating or terminating on the DRR based on information provided by NS in discovery. A lift and ramp cost is included based on the amount NS incurs for providing lift and ramp services at intermodal terminals located on the NS lines included in the DRR network.[52] The costs were calculated at each NS facility and applied on a facility by facility basis to the containers and trailers handled at each facility by the DRR.

The lift and ramp services include costs for {

}. The DRR provides dray services for very few intermodal units. For these units a cost per dray of $994 is included based on the amount per dray as developed from NS' R-1 Annual Report. The total intermodal lift, ramp and dray expenses incurred by the DRR equal $90.8 million in the base year.[53]

b. Automotive Handling Cost

Automotive handling costs are included for loading and unloading automobiles to and from railcars. The handling cost per unit equals ${ } and is developed from information provided by NS in discovery. The total cost of automobile handling for the DRR equals ${ }.[54]

[52] *See* e-workpaper "NS Intermodal Terminal Cost.xlsx."

[53] *See* e-workpaper DuPont Operating Expense.xlsx."

[54] *See* e-workpaper "AUTO DISTRIBUTION DETAIL - -2008-2010.xlsx" and DuPont Operating Expenses.xlsx."

c. Costs related to Rerouted Traffic

As discussed in Part III-C, all rerouted traffic on the DRR is in the form of internal reroutes and in all instances except one the rerouted traffic moves a shorter distance or nearly the same distance as NS' actual route. As these moves are internally rerouted, NS does not incur any additional costs as a result of the rerouted traffic.

d. Calculation of Annual Operating Expenses

As noted at the beginning of this Part, the statistical inputs used to develop the DRR's annual operating expenses (equipment and operating personnel needs, locomotive unit miles, crew starts, *etc.*) were developed by DuPont's expert operating, IT and engineering/MOW witnesses, with assistance from DuPont's witness Burris. Mr. Burris also developed the annual salaries, equipment and operating unit costs. Mr. Burris used all of these inputs to develop the DRR's Base Year operating expenses.[55]

The procedures used to develop the DRR's annual operating expenses for the Base Year were approved by the Board in *WFA/Basin*, i.e., applying transit times calculated for the peak period of the peak year to a full year of train data to calculate operating statistics, rather than calculate statistics for the peak week and expanding those statistics to reflect a full year of data.[56]

The resulting operating statistics determined for Base Year trains were used to develop first-year operating expenses. The Base Year operating expenses were then provided to DuPont Witnesses Crowley and Fapp who developed operating expenses for each period in the DCF model.

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[55] *See* e-workpaper "DRR Operating Expense.xls."

[56] The DRR moves a total of 185,568 trains in the Base Year moving between 2,965 on-SARR/off- SARR pairs. Operating statistics and crew requirements were developed specifically for 178,471 trains moving between 797 DRR on-SARR/off-SARR pairs and representing 96.2 percent of all Base Year trains. The resulting operating statistics and crew starts were expanded to reflect 100 percent of all trains, the remaining 7,097 trains move between 2,168 on-SARR/off-SARR pairs. The level of effort required to develop specific operating statistics for these remaining trains was determined to not be practical.

Part III-E

III. E NON-ROAD PROPERTY INVESTMENT

The testimony in this Part is being sponsored by Philip H. Burris of L.E. Peabody & Associates, Inc. His credentials are detailed Part IV.

1. Locomotives

As previously described, the DRR leases ES44AC and GP38 road locomotives and SW1500 switching/work train locomotives. The annual lease cost is included as an operating expense. The acquisition of all locomotives is described in Part III-D.

2. Railcars

The DRR also leases all of the railcars needed to serve the traffic group which are not supplied by the shippers or foreign railroads. The annual lease cost is included as an operating expense, as described in Part III-D.

3. Other

As explained in Part III-D most of the DRR's other equipment, including company vehicles, maintenance-of-way equipment such as hi-rail trucks, radios and telephones will be leased or purchased. The annual lease cost for this equipment is included as an operating expense. To the extent any of this equipment is purchased, the purchase price is annuitized and included with operating expenses.

Some items of equipment will be purchased, in particular, computers and related hardware. The DRR's computer system needs, and the associated capital investment, are described in Part III-D.

The DRR operates over 818.87 miles of track through trackage rights or joint facilities agreements in the same capacity as NS does today. These agreements and their locations are discussed in Part III-C. This track is owned by NS, CSXT, CN, BNSF, Conrail and others. Payments to these carriers for the operating rights are on a usage basis and are included in the DRR's operating expenses.

Part III-F

III. F. ROAD PROPERTY INVESTMENT

The DRR replicates approximately 7,272.94 route miles of existing NS track in 20 states (Alabama, Delaware, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia and West Virginia). The areas through which the track runs include rural undeveloped areas as well as major metropolitan areas.

The DRR's road property investment costs are summarized in Table III-F-1 below and Exhibit III-F-1.

Table III-F-1
DRR Road Property Investment Costs
(in millions)

	Item (1)	Investment (3)
1.	Land	$3,371
2.	Roadbed Preparation	3,978
3.	Track Construction	8,273
4.	Tunnels	444
5.	Bridges	1,926
6.	Signals & Communications	1,606
7.	Buildings & Facilities	233
8.	Public Improvements	121
9.	Subtotal	**$19,952**
10.	Mobilization	448
11.	Engineering	1,658
12.	Contingencies	1,869
13.	Total Road Property Investment Costs	**$23,927**

Source: Exhibit III-F-1.

This testimony is being sponsored by Richard R. Harps, MAI, CRE, John G. Pinto, CRE, Elizabeth W. Vandermause, MAI and Daniel C. Vandermause (land acquisition costs), Philip H. Burris (easements), Harvey A. Crouch (construction costs and bridge designs and costs), Charles

A. Stedman (roadbed preparation costs excluding culverts), and Victor F. Grappone (signals and communications system costs). These Witnesses' qualifications are included in Part IV.

1. Land

Land acquisition costs for the DRR were developed by Richard R. Harps, MAI, CRE, John G. Pinto CRE, Elizabeth W. Vandermause, MAI, Daniel C. Vandermause and their project team. Mr. Harps has over 35 years of experience as an appraiser and consultant. He holds the Member of the Appraisal Institute ("MAI") designation from the Counselors of Real Estate. In addition, he was President of the Washington, D.C. Association of Realtors in 1985. The team he has put together for this assignment brings an extensive background in real estate appraisal and experience in appraisal of transportation rights of way including valuation of rail properties throughout the United States and Canada.

In this appraisal, the "Across the Fence" methodology was used. This method estimates the value of the right of way by establishing the value of adjacent lands and parcels of land in proximity to the ROW with the same zoning as lands abutting the ROW.

A summary of the results of Mr. Harps' analysis is shown in Table III-F-2 below.

Table III-F-2
DRR Land Acquisition Acreage And Costs

Property Type (1)	Acreage (2)	Cost (in millions) (3)
1. ROW		
a. Fee-Simple	77,295	$2,808.3
b. Easement	9,103	0.5
2. Yard	3,725	539.2
3. Other		
a. Microwave Towers	604	22.8
4. Total	90,727	$3,370.8

Source: *See* e-workpapers "DuPont SAR Land Valuation – April 24 2012.pdf"

Detailed discussions of each of these property types follow.

a. Right-of-Way Acreage

The majority of the right-of-way is based upon an average width of 100 feet.[1] In urban locations an average width of 75 feet was used.[2] And, in each location where additional trackage or space is required, acreage has been added.

The DRR will acquire 86,398 acres, 77,295 acres in fee simple and 9,103 acres via easement, for its right-of-way.[3]

b. Yard Acreage

The DRR has six major yards and several lesser yards whose locations are fully discussed in Parts III-B and III-C. The DRR headquarters building is located at the Roanoke yard. Locomotive shops are located at Elkhart, Conway, Roanoke and Chattanooga. Yards throughout the DRR system are primarily used for interchange, classification, car and locomotive inspections and fueling. DRR will acquire 3,725 acres for its yards.[4]

c. Other Acreage

The DRR will place 302 microwave towers along its right-of-way. The DRR will acquire two (2) acres per microwave tower site for a total of 604 acres for microwave towers.[5]

d. Property Values

Based on the inspections and analyses undertaken by Mr. Harps and his team, and the easement costs developed by Mr. Burris, DuPont has determined that the total cost for the ROW needed for the DRR's lines as of June 1, 2009, is $3,370.8 million as summarized in Table III-F-

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1 The 100 foot right-of-way has been utilized consistently by both parties in prior SAC cases and accepted by the Board. *PSCO/Xcel* at 86.

2 *See Duke/CSXT* at 72-73; *Wisconsin P&L* at 1018; *West Texas Utilities* at 702.

3 *See* e-workpaper "DuPont SAR Land Valuation – April 24 2012.pdf."

4 *Id.*

5 *See* e-workpaper "DuPont SAR Land Valuation – April 24 2012.pdf."

2 above. A detailed description of Mr. Harps approach to developing these land acquisition costs is included in DuPont's workpapers.[6]

Property values were determined by evaluating the value of land adjacent to or in the proximity of the ROW consistent with recent Board decisions.[7] The acquisition price for land is assumed to be equal to the market value of the Across-The-Fence ("ATF") properties.

Mr. Harps and his team utilized aerial imagery from Google Earth Pro to trace the path of the DRR. Adjacent land uses were noted along the way and used to define the land use type on both sides of the ROW. The ROW is split down the centerline with the adjacent land use defined for half of the ROW width on each side of the centerline. A new segment was defined when the ATF land use changed on either side of the ROW. Using this approach, 6,893 line segments were created.

Following the review of the aerial imagery, Mr. Harps and his team performed physical inspections of the ROW in 18 urban areas, covering 373 miles of ROW. These inspections took place during September 2011 and October 2011 and were used to verify the land use determined using aerial imagery as well as to provide additional information.

This process identified six types of land use along the ROW that were used to determine comparable sales. Table III-F-3 below summarizes the percent of each type of land use along the DRR ROW.

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[6] *See* e-workpaper "DuPont SAR Land Valuation – April 24 2012.pdf."

[7] *Duke/CSXT* at 74 "The land along the ROW is a prime indicator of a ROW's value and has been used in all prior SAC cases."

Table III-F-3
DRR Distribution Of Land Use

Land Use Type (1)	Percent of Total (2)
1. Agriculture	61%
2. Residential	11%
3. Industrial	13%
4. Restricted	3%
5. Rural Town	8%
6. Commercial	5%
7. Total Acreage	100%

Source: "DuPont SAR Land Valuation – April 24 2012.pdf"

The most appropriate method of estimating the value of the land for this purpose is the sales comparison approach. Land is valued as if vacant and unimproved regardless of its current state. Because there were only a limited number of sales in the recent past from which to determine values, Mr. Harps expanded the timeframe for comparable sales and broadened the area of proximity to encompass a greater number of sales. Mr. Harps details his valuation approach in his Report.[8] Finally, and consistent with the principal that a SARR is not required to purchase a greater interest than the incumbent railroad possesses,[9] DuPont's Witness Burris conducted an extensive review of NS valuation maps and easement documents provided in discovery. This review identified many easements and other transfers of property ownership along the DRR ROW.

The DRR easement acreage was developed by multiplying the length of the easement along the ROW times the width of the ROW at each location. The average cost per easement

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[8] *See* e-workpaper "DuPont SAR Land Valuation – April 24 2012.pdf."

[9] *See CP&L* at 76 and *Duke/CSXT* at 74.

acre for each state was then applied to the acreage for each easement in the individual state. The total costs for DRR acreage acquired through easements is $535,000.[10]

The total land acquisition costs for the DRR are $ 3,370.8 million- comprised of $3,370.3 million for fee simple acquisitions and $535,000 for easements.

2. <u>Roadbed Preparation</u>

DuPont's roadbed preparation testimony is sponsored by witnesses Harvey Crouch and Charles Stedman. Their qualifications are detailed in Part IV. Mr. Crouch has over 30 years of freight railroad engineering experience, including service with Southern Railway and Norfolk Southern between 1977 and 1987 as a project engineer and track supervisor with the NS. His experience with NS included supervision of the construction of numerous grading and track construction projects, and railroad facilities and buildings.

Mr. Stedman has over 30 years of experience with L. E. Peabody & Associates, Inc. He has developed and presented evidence pertaining to roadbed preparation in numerous proceedings before the ICC and the Board. Mr. Stedman has also researched ICC records including the ICC's Engineering Reports.[11]

In this testimony, the ICC Engineering Reports were used to develop the DRR quantities for clearing, grubbing, earthwork, rip rap, retaining walls and lateral drainage. As noted below, the information extracted from the ICC Engineering Reports was adjusted to reflect current engineering and design specifications.

The roadbed preparation unit costs utilized herein are a combination of actual costs and Means Handbook[12] costs. The Means Handbook costs are very conservative for this application

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[10] *See* e-workpapers "DRR Easement_Open.xlsx" and "Easement Fees_Open.xlsx."

[11] ICC Bureau of Valuation B.V. Form No. 561.

[12] RS Means 2009 Site Work & Landscape Cost Data ("Means Handbook").

because the prices are based on an average of costs for projects of all sizes from around the country and assume a unionized workforce. There is no way to reflect the economies of scale inherent in a project the size of the DRR or to accurately estimate the impact of using union labor.

A summary of the DRR's roadbed preparation quantities and costs are summarized in Table III-F-4 below.

Table III-F-4
DRR Roadbed Preparation Costs[1/]

Item (1)	Cost (000) (2)
1. Clearing and Grubbing	$81,154
2. Earthwork	
a. Common	667,995
b. Loose Rock	507,766
c. Solid Rock	1,267,322
d. Borrow	679,227
e. Land for Waste Excavation	207,292
3. Drainage[2/]	
a. Lateral Drainage	49,928
4. Culverts[3/]	131,622
5. Retaining Walls	346,017
6. Rip Rap	36,899
7. Relocation of Utilities	147
8. Topsoil Placement / Seeding	1,439
9. Surfacing for Detour Roads	525
10. Environmental Compliance	177
11. **Total**	**$3,977,508**

1/ *See* e-workpaper "DRR Open Grading.xls"
2/ Yard drainage is included in building site development costs.
3/ *See* e-workpaper "Culvert Construction Costs.xls"

a. Clearing and Grubbing

DuPont reviewed the valuation section index maps accompanying the ICC Engineering Reports for the railroads traversed by the DRR[13] and identified the valuation sections applicable to the DRR. A listing of the valuation sections used in the development of the roadbed preparation construction costs for the DRR are included in DuPont's workpapers.[14]

Based on this selection of valuation sections, the clearing and grubbing quantities required for the original construction of the DRR lines were taken from the ICC Engineering Reports. These quantities were then modified to reflect current construction specifications.[15]

Historically, clearing and grubbing costs have been developed and applied separately depending on the acreage requiring the grubbing of tree stumps. In this case, however, DuPont's engineers based the clearing and grubbing costs on a recent railroad realignment project in Tennessee, the Trestle Hollow Project, and applied this cost to all DRR acreage to be cleared. The project took place in 2007 and involved re-routing and building a new rail line near Centerville, TN. The cost for clearing and grubbing was $2,000 per acre and included "clearing and grubbing of all trees, stumps, undergrowth, brush, trash, grass, weeds, roots, debris, or other deleterious or objectionable materials…."[16] Stumps, roots and other debris were to be removed to a minimum depth of 18 inches below the surface and/or subgrade, whichever was lower and also included removal and stockpile of topsoil. DuPont indexed the 2007 unit costs to June

13 The ICC Engineering Reports were compiled in the first quarter of the 20th century. At that time, the current lines of NS were owned by many different railroads.

14 *See* e-workpaper "DRR Open Grading.xlsx," tab "Eng Rep Input."

15 The clearing and grubbing quantities (acres per track mile) were increased by the ratio of the current roadbed specifications to the original roadbed specifications and applied to the track miles (including yards and sidings) of the DRR's line segments to develop current clearing and grubbing quantities. *See* e-workpaper "DRR Open Grading.xlsx," tab "Other Items".

16 *See* e-workpapers "Trestle Hollow Project Cost Sheet.pdf," and "Trestle Hollow Project Specs.doc."

2009, the start date of the DRR. The indexed unit cost for clearing and grubbing is $ 2,111 per acre.

Applying this combined unit cost to the total acres requiring clearing conservatively overstates the total costs as not all acres have trees or require grubbing. 38,444 acres will be cleared and grubbed for the construction of the DRR at a total cost of $81.2 million at 2Q09 levels.[17]

DuPont has not included any additional costs for stripping or undercutting as these are included in the Trestle Hollow unit costs.[18]

b. Earthwork

The ICC Engineering Reports were utilized to develop the earthwork quantities for each valuation section covering the line segments of the DRR. These quantities were adjusted to reflect current roadbed specifications. The adjusted earthwork quantities were then used to develop the earthwork requirements and costs for the DRR. A combination of actual unit costs from the Trestle Hollow Project (indexed to 2Q09) and the Means Handbook average costs were used to develop the earthwork costs.

Table III-F-5 summarizes the earthwork quantities and costs associated with construction of the DRR.

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[17] DuPont notes that in recent stand-alone cost proceedings, complainants have used two different costs for clearing and one cost for grubbing, all from the Means Handbook. For the acres that were grubbed (according to the ICC Engineering Reports), complainants assumed that trees were also cleared and applied both the cost per acre for clearing and the cost per acre for grubbing from the Means Handbook. For the remaining acres of clearing (i.e., those acres not requiring grubbing), complainants applied a cost for brush clearing. This approach has been accepted by the STB. See *AEP Texas* at 78-79, *AEPCO* at 83-84. While DuPont believes the use of actual clearing costs is superior to the costs from the Means Handbook, DuPont has included these alternate calculations in its workpapers. *See* e-workpaper "DRR Open Grading.xlsx," tab "Other Items."

[18] Additionally, prior decisions from the Board support exclusion of these costs. *PSCo/Xcel* at 90, *WFA/Basin* at 83, *AEP Texas* at 74, *Duke/CSXT* at 80, *AEPCO* at 84-84.

Table III-F-5
DRR Earthwork Quantities And Costs

Item (1)	Cubic Yards (000) (2)	Cost (000) (3)
1. Common Excavation	374,645	$667,995
2. Loose Rock Excavation	49,223	507,766
3. Solid Rock Excavation	92,230	1,267,322
4. Borrow	43,568	679,227
5. Total	559,666	$3,122,310

Source: *See* e-workpaper "DRR Open Grading.xlsx," tab "EW Cost.".

i. ROW Quantities

DuPont engineers pulled the main-line, other main track, and all other track from the applicable ICC Engineering Reports. They also extracted the cubic yards ("CY") of excavation and embankment material by type – common, loose rock, solid rock and embankment (borrow).[19] The grading quantities from the ICC Engineering Reports were then used to develop distribution percentages for the four categories.[20] Based on a review of railroad construction literature prevailing at the time the ICC Engineering Reports were compiled, DuPont's engineers estimated that the ICC Engineering Report quantities for the rail lines comprising the DRR reflect average roadbed widths of 19 feet for fills and 23 feet for cuts (including ditches).[21] The earthwork quantities obtained from the ICC Engineering Reports were adjusted to reflect the requirements of today's heavier trains. Table III-F-6 shows the more modern roadbed widths utilized in the construction of the DRR.

[19] *See* e-workpaper "DRR Open Grading.xlsx," tab "Eng Rep Input."

[20] *See* e-workpaper "DRR Open Grading.xlsx," tab "Distribution."

[21] *See* William C. Willard, *Maintenance of Way & Structures*, McGraw-Hill Book Company, 1915, pp. 29-31 included in e-workpaper "Original Roadbed Widths.pdf."

Table III-F-6
Roadbed Widths For Construction Of The DRR

Track Type (1)	Roadbed Width[1/] Fills (2)	Roadbed Width[1/] Cuts (3)
1. Single Track	24 feet	40 feet
2. Double Track	39 feet	55 feet

[1/] Based upon 15 foot track centers and a side slope of 1.5 to 1.

The adjusted earthwork quantities for the construction of the DRR based on the above specifications are contained in the accompanying workpapers.[22]

The calculation of the earthwork quantities for the DRR's line segments are detailed in our workpapers.[23] First, the DRR line segments were matched with the applicable valuation section. Next, the track miles for each segment were categorized as first main (route miles), other main (multiple track and passing sidings) and other track (such as set out tracks) based on the DRR's track configuration shown in the DRR stick diagrams. Finally, the number of track miles was multiplied by the applicable cubic yards per mile for the appropriate valuation section.

ii. Yard Quantities

As discussed in Part III-B, the DRR has six major yards and numerous lesser yards (including interchange yards).[24] For each yard, DuPont calculated the grading requirements based on an assumed average fill height of one foot and 25-foot track centers.[25]

[22] *See* e-workpaper "DRR Open Grading.xlsx," tab "Earthwork by val sec."

[23] *See* e-workpaper "DRR Open Grading.xlsx," tab "CY Grad by seg."

[24] *See* e-workpaper "DRR Yard Matrix Open Grading.xlsx."

[25] The one-foot fill height was used for Open Grading the yards because an assumed fill height of one foot is used to allocate earthwork quantities to the yard tracks involved in the original construction and reflected in the ICC Engineering Reports. This methodology has been applied repeatedly, and accepted by the STB, to develop SARR yard earthwork quantities. *See Wisconsin P&L,* 5 S.T.B at 1022, *PSCo/Xcel, 7 S.T.B.* at 675, *AEP Texas* at 81, *Otter Tail* at D-10, *Duke/NS*, 7 S.T.B. at 172, *CP&L*, 7 S.T.B. at 310-311, *Duke/CSXT,* 7 S.T.B. at 477 and *AEPCO* at 90. *See* e-workpaper "DRR Open Grading.xlsx," tab "Yards."

Yard earthwork is classified as excavation because the estimated yard track quantities removed from the ICC Engineering Report total quantities were removed from the excavation quantities for each valuation section.

iii. Earthwork Unit Costs

Harvey Crouch and his associates are familiar with much of the territory traversed by the DRR and knowledgeable about the appropriate equipment required for excavation. Rail lines, including the lines comprising the DRR, are generally laid out to follow the natural ground as much as possible, minimize grade changes and avoid difficult terrain whenever possible. The DRR relies upon the same least-cost-but-feasible grading approach previously accepted by the STB.[26]

(a). Common Earthwork

In most previous stand-alone proceedings, earthwork excavation unit costs have been based on the Means Handbook.[27] The costs in the Means Handbook are conservative because they are based on an average of costs for projects of all sizes from around the country, without specific consideration for the economies of scale that would benefit the DRR due to the much larger project size involved. Using the Means Handbook, DuPont's engineers have calculated a common excavation unit cost.[28]

The DRR traverses some areas that DuPont classified as adverse, i.e., the territory is more difficult and access is limited due to the terrain. Based on a review of topographical maps, these areas are: (1) the line between Pittsburgh, PA and Harrisburg, PA; (2) the line between Alloy,

[26] *FMC at 800* "UP has not shown that it would be infeasible to use the equipment selected by FMC… FMC is entitled to have the equipment that results in the overall lowest cost used. Therefore, we use FMC's unit costs for grading to determine earthwork costs." *See also Duke/CSXT* at 78-80; *PSCo/Xcel* at 95-98.

[27] *See PSCo/Xcel* at 95-97, *AEP Texas* at 81-82, *Otter Tail* at D-11-12, *Duke/CSXT* at 78-79, *Duke/NS* at 93-95 and *CP&L* at 80-82.

[28] *See* e-workpaper "DRR Open Grading.xlsx," tab "Unit Costs."

WV and Walton, VA; (3) portions of the line between Harrisburg, PA and Perryville, MD; (4) portions of the line between Roanoke, VA and Bristol, TN; (5) portions of the line between Somerset, KY and Chattanooga, TN; (6) the Celco Branch; (7) the Waynesville Branch; and (8) portions of the Asheville Branch.[29] Using the Means Handbook, DuPont's engineers calculated the cost for common excavation in adverse areas.[30]

Beginning with *WFA/Basin*, complainants used costs from actual railroad construction projects. The common excavation cost per CY based on an actual BNSF track construction project was accepted by BNSF and the STB.[31] This trend continued in *AEPCO*, where complainant relied on costs from five BNSF railroad projects and this was accepted by the Board.[32]

In this proceeding, NS provided a limited number of documents containing earthwork cost information in response to DuPont's discovery requests. Virtually all of the documents were { } estimates with CY quantities ranging from { }. These projects reflected { } construction. None of these projects are remotely akin to new rail construction like the DRR.

Moreover, projects undertaken by the { } are generally projects involving additions or modifications to existing track and right-of-way, many times requiring construction under traffic, or adjacent to active tracks. This drives the cost up since site access is limited, work has to be conducted in limited work windows, and work has to

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29 *See* e-workpaper "DRR Open Grading.xlsx," tab "EW Cost."

30 *See* e-workpaper "DRR Open Grading.xlsx," tab "Unit Costs."

31 *See WFA/Basin* at 86 (the parties agreed on the unit costs for common excavation), WFA/Basin April 19, 2005 Opening (Public Version) at III-F-36-37 (describing the source of the common excavation unit cost) and WFA/Basin September 30, 2005 Rebuttal (Public Version) at III-F-56 (stating that BNSF accepted WFA/Basin's common excavation unit cost).

32 *See AEPCO* at 86-88.

be performed in a manner that is safe with respect to the railroad and its contractor and the contractor's activities.

In the two most recent stand-alone decisions, complainants have proposed, and the STB has accepted, common earthwork unit costs based on actual projects instead of the Means Handbook. DuPont has continued that trend. As discussed in the previous section on clearing and grubbing, DuPont's Witness Crouch was involved with the Trestle Hollow Project, a railroad realignment project in Tennessee which required the construction of a new railroad line. While this project is short in length, it differs from the projects provided by NS in discovery in at least two ways. First, it is an actual project with actual quantities and costs as opposed to an estimate of quantities and costs. Second, it reflects new rail line construction and there were considerable amounts of earthwork moved.[33]

The Trestle Hollow project involved constructing a complicated, new alignment for the South Central Tennessee Railroad west of Nashville. This project was challenging for several reasons. The purpose of the project was to bypass several large timber bridges approximately 100 years old. The alignment was designed to improve the vertical grade and reduce curvature. The new design was difficult due to the hilly terrain and included several tall embankments and deep cuts all on an average 2.4 percent grade. Clearing was difficult due to the hilly nature of the land and the size of the trees. The material excavated was a combination of common earth and loose rock. DuPont's engineers are being conservative by using the Trestle Hollow cost for only common excavation.

Common earthwork excavation costs for the DRR are based on the actual unit cost from the 2007 Trestle Hollow project of $1.65 per CY indexed to 2Q09. This unit cost includes all

[33] *See* e-workpapers "Trestle Hollow Project Specs.doc" and "Trestle Hollow Project Cost Sheet.pdf." *See also,* the directory "Trestle Hollow Pictures" included with DuPont's opening workpapers.

necessary work to prepare the roadbed for the placement of subballast, the handling of waste and hauling it to off-site locations as needed, as well as costs associated with any water for compaction that might be necessary.[34]

For the DRR line segments that were designated as adverse, the ratio between Means Handbook costs under ideal conditions and costs under adverse conditions was used to adjust the Trestle Hollow Project unit cost.

The cost for common excavation is \$1.74 per CY with \$2.15 per CY used in areas with adverse conditions.

(b). <u>Loose Rock Excavation</u>

Loose rock excavation is a category on the ICC Engineering Reports that does not have a counterpart in today's railroad construction environment. Railroads today use the categories of common (or unclassified) and solid rock. Thus, DuPont is being extremely conservative by applying a separate loose rock cost to such excavation rather than including it with the common excavation quantities. Loose rock excavation costs are based on the use of two 300 HP dozers for ripping the loose rock and pushing it into piles, a 3CY power shovel for placing the ripped and dozed rock into the truck (including the Means 15% additive), a 42 CY off highway truck to haul the material to the fill or disposal site, and a dozer to spread the material after it is dumped. Each of the 300 HP dozers is equipped with rock rippers at the rear and large push blades in front. The 42 CY off highway truck was selected because it is capable of turning in a 27' 11" radius and thus suitable for work in a railroad right-of-way.[35]

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[34] *See* the construction specifications contained in e-workpaper "Trestle Hollow Project Specs.doc" at 152-153.

[35] *See* e-workpaper "42 CY Truck.pdf."

The cost for loose rock excavation is $10.25 per CY with $10.52 per CY used in areas with adverse conditions.[36]

(c). Solid Rock Excavation

The unit cost for solid rock blasting is based on an average of the Means Handbook cost for blasting rock over 1,500 cubic yards and the cost for bulk drilling and blasting. DuPont has added the costs to excavate the blasted rock, load it into trucks, haul it away, and dump it. In addition, the cost to spread the material, and the average compaction cost for embankment that was used for the other earthwork categories was also applied.[37]

DuPont's engineers used a 50/50 combination unit cost made up of the solid rock unit cost ($17.11 per cubic yard in all conditions) and the loose rock unit cost ($10.25 per CY and $10.52 per CY in adverse conditions) based on their expert opinion that at least half of the quantities classified by the ICC as solid rock would be rippable (and therefore classified as loose rock or common excavation) using modern equipment.[38] This 50/50 combination results in a cost per CY of $13.68 for solid rock excavation with $13.82 per CY used in areas with adverse conditions.

(d). Embankment/Borrow

The Means Handbook-based unit costs for borrow utilized by the DuPont engineers are based on a five cubic yard wheel-mounted front end loader, 20 CY capacity dump trucks to haul material to the construction site, a dozer to spread the material, and the average compaction cost

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[36] The unit costs from the 2009 Means Handbook are indexed to 2Q09 levels and adjusted by the Means Handbook location factors. *See* e-workpaper "DRR Open Grading.xlsx," tabs "Unit Costs" and "Loc Factor."

[37] DuPont's solid rock excavation unit cost development is consistent with recent Board decisions. *See WFA/Basin* at 86-87, *AEP Texas* at 82-83, *PSCo/Xcel* at 96-97 and *AEPCO* at 89-90.

[38] This 50/50 combination has been repeatedly accepted by the Board. *See WFA/Basin* (parties agreed, not mentioned or altered in decision); *AEP Texas* (parties agreed, not mentioned or altered in decision); *Otter Tail* at D-12; *PSCo/Xcel* at 96 (where BNSF also agreed on this split); *Duke/NS* at 93-94; *CP&L* at 80; *Duke/CSXT* at 78; *AEPCO* at 90.

for embankment that was used for the other earthwork categories.[39] Borrow unit costs equal $15.59 per CY at 2Q09 levels.

(e). Land for Waste Excavation

Not all of the excavated material for the DRR is re-used as fill. Consistent with the procedures used in other SAC cases, DuPont's earthwork calculations assume a 30 percent waste ratio. As this waste material needs to be placed somewhere, the DRR is acquiring additional land along the right-of-way to accommodate the dumping of the waste material. DuPont's engineers have assumed an average 15-foot depth for wasted materials. DuPont has included an additional 7,678 acres of rural land for this purpose at an estimated $27,000 per acre for a total cost of $207.3 million.

(f). Total Earthwork Cost

The total earthwork cost associated with constructing the DRR including the cost of land for waste excavation is $3,329.6 million.

c. Drainage

i. Lateral Drainage

The linear feet of pipe per route mile for lateral drainage was obtained from the ICC Engineering Reports and applied to the DRR's line segments. The cost per linear foot for installed drainage pipe, including backfill and compaction, was taken from the 2009 Means Handbook indexed to 2Q09 and adjusted by the Means Handbook location factors. Based on the ICC Engineering Reports, the DRR requires 2,055,497 linear feet of lateral drainage pipe. The DRR's total investment in lateral drainage equals $49.9 million at 2Q09.[40]

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39 This is consistent with prior SAC proceedings. *See AEP Texas* at 81 and *Otter Tail* at D-13.

40 *See* e-workpaper "DRR Open Grading.xlsx," tab "Other Items."

ii. Yard Drainage

DuPont's engineering experts have included minimal yard drainage facilities in the way of catch basins and drainage pipe for each of the DRR's six (6) major yards. Prior to the installation of any drainage facilities, the roadbed for yard track construction will be constructed to slope away from the main line. Storm water runoff will drain freely through the ballast and be collected by ditch lines along the perimeter of the yards. These ditches will then convey the storm water runoff offsite. Low areas can occur near facilities and between tracks separated by non-typical spacing. In those instances, catch basins are used to collect the water in the low areas. This water is then conveyed under the track to the perimeter ditch.

Yard drainage for the DRR will cost $6.4 million for catch basins and $22.3 million for drainage pipe and is included in the yard building site development costs.

d. Culverts

Culverts are devices placed in the roadbed to facilitate the movement of water from one side of the track to the other where large drainage areas, typical of bridges, are not required. The culverts specified by DuPont's engineers are corrugated aluminized metal pipe ("cmp"). All culverts used by the DRR are adequate to withstand railroad loadings to a gross weight on rail of 286,000 pounds per car (Cooper E-80 standards).

Culverts on the DRR also replace any bridges less than 20 feet in length, assuming that the bridge crosses a waterway.[41]

i. Culvert Unit Costs

Unit costs were developed from costs provided in quotes from multiple metal pipe manufacturers and the Means Handbook. Unit costs for corrugated metal pipe ("cmp") are driven by the linear feet (lf) of length of each culvert required in a particular location as well as

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[41] *See, e.g., AEP Texas* at 93.

the diameter of the pipe.[42] Additional unit costs were developed for excavation, furnishing and placing crushed stone for bedding material, and backfill.[43]

ii. Culvert Installation Plans

All culverts are installed during the early stages of preparation of the subgrade for the railroad. The sites are easily accessible, in part through the ongoing preparation of the roadbed and in part because much of the DRR's ROW is near public roads. Moreover, the culverts can be installed with a minimum of excavation using the open trench method of installation.

Specifically, once the base layer of the roadbed is in place, the trench for the cmp is excavated one foot wider on each side than the culvert width. The bottom of the excavation is covered with an average depth of 12" of crushed stone bedding material to act as a foundation and cushion for the culvert, providing a means for transferring the load into the ground below the culvert as well as a level surface. The first culvert section is placed on the prepared bedding material. The next section is placed adjacent to the first and a connecting band is installed to connect the two sections. This continues until all sections have been set in place. The culvert is then backfilled. After the subbase has been prepared, most culverts can be installed in less than one day.

Work production of the crews is consistent with DuPont's proposed construction schedule because there are no deep trenches to excavate or work in, and by installing the culverts at this stage of the project, no waterway diversions are required. Moreover, in the few instances where water is flowing immediately adjacent to the culvert, the culvert can be installed while the water is flowing.

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[42] *See* e-workpaper "Culvert Construction Costs.xls."

[43] The price of bedding material is from the Trestle Hollow Project. All other unit costs are from the Means Handbook. *See* e-workpaper "Culvert Construction Costs.xls."

iii. **Culvert Quantities**

DuPont's engineers used the culvert inventories provided by NS in discovery to form an initial culvert list. To develop a cost for the culverts on the DRR, all culverts less than 20' in length were removed from the list, because they did not go through the full width of the roadbed, so that only culverts that provided drainage under the DRR line were included. The list was then converted to equivalent circular pipe sizes of 24", 36", 48", 60", 72", 84", 96", 108", or 120".

Second, in many instances, the culvert inventories provided by NS did not include any culvert length data. DuPont's engineers have, therefore, assumed that the culvert length will be set in accordance with the standard roadbed widths for cut and fill sections. Further, in many cases, NS's culvert inventory list did not indicate the size of the culvert being used; in those cases a size of 24" was assumed. In order to ensure that the DRR's culverts could meet the loading requirements of the DRR, DuPont's engineers elected to use aluminized cmp for all culvert installations.

iv. **Total Culvert Costs**

The total cost of the DRR's culverts is $131.6 million.[44]

e. **Other**

i. **Ditches**

The DRR has side ditches in cuts that are two feet wide and two feet deep and that are trapezoidal in section. Two-foot ditches have repeatedly been accepted by the Board.[45]

ii. **Retaining Walls**

Retaining wall quantities for the DRR are also extracted from the ICC Engineering Reports. The Engineering Report data includes cubic yards of masonry, timber walls, and walls

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[44] *See* e-workpaper "Culvert Construction Costs.xls."

[45] *See Duke/NS* at 90, *CP&L* at 78, *Duke/CSXT* at 76, *TMPA* at 701, n.183, *Wisconsin P&L* at 1023.

made from timber ties and pilings under the category "Protection of Roadway" included in Account 3, Grading. Rather than construct masonry or timber retaining walls, the DRR uses gabions (galvanized steel mesh boxes filled with rock) for all of its retaining walls. Gabions are suitable because they can be assembled on site and bent to fit the existing terrain.

DuPont has used the cost for retaining wall gabions (including the rock) and the cost for timber pilings from the 2009 Means Handbook. Total retaining wall investment for the DRR equals $346 million at 2Q09 levels.[46]

iii. Rip Rap

DuPont's engineers developed rip rap quantities from the ICC Engineering Reports, and applied the unit cost from the Means Handbook to machine-place the rip rap. The material portion (rock) of the unit cost is included because the material is not readily available from the excavated rock that is wasted. DuPont has included $36.9 million for rip rap investment at 2Q09 levels.[47]

iv. Relocating and Protecting Utilities

Virtually all of the lines being replicated by the DRR were constructed by NS's predecessors in the 19th and early 20th centuries. Few, if any, utility lines existed at that time and would have had to be relocated. These costs were not incurred by the incumbent and thus, under the *Coal Rate Guidelines*, would constitute a barrier to entry if imposed on the DRR.[48]

However, DuPont's engineers identified 2 DRR branch lines, totaling 10.3 route miles, which could not be found on the ICC valuation maps accompanying the ICC Engineering

[46] *See* e-workpaper "DRR Open Grading.xlsx," tab "Other Items."

[47] This rip rap investment does not include the rip rap used on culvert faces and for bridge pier and abutment protection. Those costs are included, where needed, in the appropriate investment category. Details on rip rap investment for roadbed preparation are provided in e-workpaper "DRR Open Grading.xlsx," tab "Other Items."

[48] *See AEP Texas* at 84; *PSCo/Xcel* at 100; *Duke/CSXT* at 83.

Reports. Therefore, DuPont's engineers assumed that these rail lines were constructed in the second half of the 20th century. Consistent with prior STB decisions, DuPont included $0.1 million, based on the cost per mile in *WFA/Basin*, for costs to relocate and protect utilities on these lines.[49]

v. Seeding/Topsoil Placement

Embankment protection quantities for all lines other than the recently-constructed branch lines were derived from the ICC Engineering Reports. Based on the ICC Engineering Report data, only 0.008 percent of the lines being replicated by the DRR had embankment protection quantities. For the recently-constructed branch lines, DuPont's engineers estimated the acres per mile for seeding/topsoil placement based on the average acres per mile for the 79-mile Orin Line, constructed by the BNSF Railway in Wyoming during the 1970's. The Orin Line is the last significant new rail line construction in the U. S.

For seeding and topsoil placement costs, DRR's engineers relied upon the unit cost of $1,600 per acre from the Trestle Hollow Project indexed to $1,688.78 per acre at 2Q09 levels.[50] Total DRR investment costs for seeding/placing topsoil equal $1.4 million.

vi. Water for Compaction

In the Eastern coal rate cases, the Board agreed with complainants that water for compaction was not necessary in the areas traversed by the stand-alone railroads because there is sufficient water content in the region to allow for proper compaction.[51] Consistent with the territory traversed by the stand-alone railroads in the Eastern coal rate cases, the DRR rail lines

[49] *See* e-workpaper "DRR Open Grading.xlsx," tab "Other Costs."

[50] *See* e-workpapers "Trestle Hollow Project Cost Sheet.doc" and "DRR Open Grading.xlsx," tab "Other Costs."

[51] *See Duke/CSXT* at 83-84, *Duke/NS* at 99 and *CP&L* at 85.

traverse sub-humid, moist sub-humid and humid areas and not arid and semi-arid areas.[52] In any event, even if water for compaction was necessary in a certain area, the common earthwork unit costs relied on by DuPont include any incidental items such as water.[53]

vii. Surfacing for Detour Roads

DuPont's engineers did not include costs for any road detours for the DRR's lines that are covered by ICC Engineering Reports, as it is unlikely that NS incurred any costs for this item when the lines were originally built, and NS did not provide any information in discovery indicating that it incurred such costs. This is consistent with the approach approved by the Board in other SAC cases.[54]

For the DRR's recently-constructed branch lines, DuPont's engineers included an estimate of $0.5 million for the cost to provide road detours during construction.[55]

viii. Construction Site Access Roads

In general, the DRR's track subgrade is used for its site construction roads. In addition, most of the DRR right-of-way is accessible from public roads and highways, thereby permitting construction access without building separate access roads. Further, the initial construction activity includes clearing the DRR right-of-way and creating initial site access with the heavy construction equipment. As the site is leveled by either cutting or filling the right-of-way, access roads are created for moving earth, rock and other materials to and from the construction sites. In any event, no additional costs should be incurred for site construction access roads because the Trestle Hollow project, used for common excavation costs, required the contractor to provide its

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[52] *See* e-workpaper "DRR Route avg rainfall.pdf."

[53] *See* e-workpaper "Trestle Hollow Project Specs.doc."

[54] *See PSCo/Xcel* at 101; *Duke/NS* at 100; *CP&L* at 86; *Duke/CSXT* at 84; *TMPA* at 707-708; *Wisconsin P&L* at 1024-1025; *FMC* at 802.

[55] *See* e-workpaper "DRR Open Grading.xlsx," tab "Other Costs."

own, uncompensated, access to the site.[56] DuPont's position on this issue is consistent with several prior SAC decisions.[57]

ix. Environmental Compliance

DuPont included environmental compliance costs only for the two recently constructed branch lines. Inclusion of these costs on the lines originally constructed in the 19th and early 20th centuries by NS or its predecessors would constitute a barrier to entry.[58]

Total environmental compliance costs for the DRR equal $ 0.2 million.

3. Track Construction

DuPont's track construction testimony is sponsored by Witness Harvey Crouch. His qualifications are detailed in Part IV.

Track construction is the work required to lay track once the subgrade has been completed. This includes placing subballast, ballast, ties, rail, and other track components. The total quantities and costs required for construction of the DRR are summarized in Table III-F-7 below.

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[56] *See* e-workpaper "Trestle Hollow Project Specs.doc."

[57] *See Duke/CSXT* at 76; *Duke/NS* at 90-01; *CP&L* at 78; and *AEP Texas* at 80.

[58] *See Wisconsin P&L* at 1025 (the parties agreed that environmental mitigation was only required for the recently constructed segments); *PSCo/Xcel* at 101 (the parties agreed on the inapplicability of such costs); *AEP Texas* at 83. *See also* the public evidence (complainants' Rebuttal Evidence) in *WFA/Basin* where environmental compliance costs were applied only to recently-constructed lines - Docket No. 42088 (Public Version) filed Sept. 30, 2005, Narrative Vol. II at III-F-81-82. Details supporting environmental compliance costs for the DRR are provided in e-workpaper "DRR Open Grading.xlsx."

Table III-F-7
DRR Track Construction costs

Item (1)	Cost (000) (2)
1. Geotextile Fabric	$2,382
2. Ballast	1,153,412
3. Ties	1,640,562
4. Track (Rail)	
a. Main Line	1,743,684
b. Yard and Other Track	768,940
c. Field Welds	33,454
d. Switches (Turnouts)	510,736
5. Rail Lubricators	2,165
6. Plates, Spikes and Anchors	855,086
7. Derails and Wheel Stops	1,289
8. Track Labor and Equipment	1,561,730
9. Total	$8,273,439

Source: *See* e-workpaper "Track Construction Costs.xls."

a. Geotextile Fabric

DuPont has placed geotextile fabric under turnouts and at at-grade crossings.[59] The cost for at-grade crossings already includes the cost for the fabric so the quantities and costs in this part are only for the amount required under the DRR turnouts. DRR requires a total of 1,985,028 SF of geotextile fabric under turnouts at a cost of $2.4 million. The total DRR geotextile quantity calculations are included in the costs of turnout and grade crossings.[60]

b. Ballast

DuPont's engineers have used 18" of ballast and subballast, consisting of a 6-inch subballast layer and a 12-inch layer of clean rock ballast for all main tracks. Diagrams of the

[59] As done and accepted in prior SAC cases – *See WFA/Basin* decision at 94-95.

[60] *See* e-workpaper "Track Construction Costs.xls."

standard DRR main track cross sections (single and double) are included in the accompanying workpapers.[61] This roadbed section conforms to NS's standard roadbed section.

DuPont's engineers used 4" of subballast and 6" of ballast under yard tracks and set-out tracks because of the lighter traffic and slower speeds. This is consistent with NS' standard roadbed section. Ballast for the DRR would be locally obtained limestone or granite, crushed to meet AREMA No. 4 size requirements and meeting Los Angeles and Mill Abrasion requirements.[62] Subballast consists of similar parent materials crushed to provide a well-graded, dense layer of crushed rock similar to road base material.[63]

Ballast and subballast quantities were developed for all sections of track based on the lengths of single and multiple track sections, and the roadbed section referenced above. As noted above, the DuPont engineers have included cross-sections of the DRR track designs. The workpapers include the volume per foot of track for all items, including the volume per foot for ballast and subballast.[64] The quantities were calculated by multiplying the sectional area in square feet by one foot in length and then dividing by 27 to obtain cubic yards. The volume of rock displaced by the volume of the ties being used in particular locations was removed from the total volume calculation.

Ballast and subballast quantities for yards were calculated assuming each track in the yard is a single track and using the 4" subballast and 6" ballast depth. DuPont's experts also used the standard conversion factor of 1.5 tons/CY in determining quantities, which is

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[61] See e-workpaper "Typical Track Sections.pdf."

[62] *See* e-workpaper "Track Construction Costs.xls."

[63] *See* e-workpaper "Trestle Hollow Specs.pdf."

[64] *See* e-workpapers "Typical Sub-Ballast.pdf" and "Ballast Sections.pdf."

conservative versus the conversion factor of 1.325 tons/CY used by the "Track Data Handbook."[65]

DuPont's engineers used prices for ballast from direct quotes obtained from suppliers and historical pricing data obtained from NS in discovery.[66] DuPont's engineers used prices for subballast from unit costs obtained for the Trestle Hollow Project, which included delivery costs as well as placement of the subballast on the roadbed. Delivered costs for ballast are based on shipping distances from the sources to the railheads throughout the DRR system, which were then multiplied by $0.035 per mile based on a transportation charge from *AEPCO*.[67] The supply and shipping costs were then totaled and averaged to develop an average cost per CY delivered for ballast. The total cost of ballast and sub-ballast for the DRR is $1,153 million.

c. <u>Ties</u>

DuPont's engineers selected wood ties with a tie spacing of 20.5 inches for all main track, passing sidings, and branch lines consistent with railroad industry standards for mainline track. The Board has also repeatedly accepted wood tie spacing of 20.5".[68] Because of the lighter traffic and slower speeds, DuPont's engineers used wood ties with 24" spacing in yards and set-out tracks.[69]

DuPont's engineers selected standard Grade 5 treated hardwood railroad ties, whose dimensions are 7" x 9" x 8'6", for all track. Unit costs for Grade 5 ties were based on quotes received from Tangent Rail. Transportation costs were added based on average distance to rail head at $0.035 per ton-mile.

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65 *See* e-workpapers "Track Construction Costs.xls" and "Typical Sub-Ballast.pdf."

66 *See* e-workpapers "Track Construction Costs.xls" and "Ballast Purchases.xls."

67 *See AEPCO* at100.

68 *See WFA/Basin* at 96; *West Texas Utilities* at 707.

69 *See WFA/Basin* at 96 (accepting this spacing in yards).

The DRR is constructing its bridges with ballast decks, thereby obviating the need for transition ties. In addition, the Board has rejected transition ties at turnouts.[70] The total cost of ties for the DRR is $1,641 million.

d. Track (Rail)

i. Main Line

As discussed in Part III-B, the DRR will use 136-pound CWR for most of the DRR's main tracks and passing sidings (20 MGT/year or greater), with premium rail used in curves 3 degrees and greater. For the lighter density portions of the DRR (less than 20 MGT/year, new 115-pound rail will be used.[71] The delivered cost used for the DRR's mainline rail is $872 per ton.[72]

The rail is welded together into approximately 1,440-foot lengths and then loaded onto a rail train. The rail is distributed by the rail installation contractor and the rail distribution costs are included in labor charges.[73] The total cost of mainline rail for the DRR is $1,744 million.

ii. Yard and Other Tracks

As discussed in Part III-B, the DRR is using new 115-pound CWR rail for yard, helper pocket tracks and set-out tracks. As with the 136-pound rail, the price includes delivery to various railheads and the materials will be distributed by the rail installation contractor. The total cost of rail for yards and other tracks for the DRR is $769 million.

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[70] *Id* at 97.

[71] *See* e-workpaper "Track Construction Costs.xls."

[72] This is the cost per ton incurred by NS in 2009 for 136-pound rail. *See* e-workpaper "Norfolk Southern Combined Railroad Subsidiaries 2009 R-1.pdf," Schedule 724.

[73] *See* e-workpaper "Track Construction Costs.xls."

iii. <u>Field Welds</u>

The cost of labor for field welds is derived from direct quotes and historical prices from projects overseen by Crouch Engineering.[74] The cost of field weld materials is included in the costs for field welding labor. *Id.* Field welds are required to connect the 1,440-foot strings of welded rail produced by the manufacturer as well as to insert insulated joints, make connections to turnouts and span grade crossings. The calculations for the number of field welds as well as the number of compromise welds (where 115-pound and 136-pound rail are joined together) are included in the workpapers accompanying this opening evidence.[75] The total cost for field welds is $33 million.

iv. <u>Insulated Joints</u>

Insulated joint requirements are addressed in the signals and communications costs discussed in Section III-F-6 below.

v. <u>Switches (Turnouts)</u>

DuPont's engineers included the number and size of turnouts specified in the DRR's stick diagrams (as discussed in Section III-B). Turnouts were also included for the DRR's yards and connections to customers served by the DRR.[76] Unit costs for turnouts were obtained from quotes from vendors.[77] The turnout quotations include all materials necessary for construction of complete No. 20 power turnouts, No. 14 power turnouts, and No. 10 hand-thrown turnouts, including, but not limited to rail, switch ties, rail, frogs, guard rails, switch points, base plates and tie plates, switch plates, switch point heel blocks, adjustable wedge brace plates for the switch point section, insulated tie bar rods, connecting rods, the switch machine, and all other

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[74] Id.

[75] Id.

[76] *See* e-workpapers "DRR Yard Matrix.xlsx" and "DRR_2010_TRAFFIC_ATC_OT_v2.xlsx."

[77] *See* e-workpaper "Track Construction Costs.xls."

items incidental to turnout construction. The total cost to the DRR for turnouts (excluding geotextiles and including switch heaters) is $511 million.[78]

e. Other

i. Rail Lubrication

Rail lubricators are used by the DRR to distribute grease to the wheel/flangeway interface. Spacing of lubricators is based on the coverage of the grease as defined by the supplier, and as warranted by track conditions. The unit cost for rail lubricators is based on quotes from vendors.[79] The DRR's total cost for rail lubricators is $2 million.[80]

ii. Plates, Spikes and Anchors

The DRR is using wood ties with cut spikes that will be used to hold the rail to the tie plate and the tie plate to the ties, and to provide lateral restraint to hold the rail to gauge (4 feet 8.5 inches inside dimension between the railheads). Two spikes per tie plate (four spikes per tie) are used on all track with timber ties and less than 3-degree curves. This spiking pattern is standard practice for U.S. railroads, and is used by NS. AREMA standards also support two spikes per plate.[81]

For curves between 3 and 6 degrees, 4 spikes per plate are used. This pattern is consistent with industry practice and AREMA.[82] For curves greater than 6 degrees, five spikes per plate are used.[83]

[78] *Id.*

[79] Id.

[80] Id.

[81] *See* e-workpaper "Spiking Pattern.pdf."

[82] Id.

[83] Id.

Rail anchors are drive-on or spring clip-on devices that clamp under the base of the rail and bear against the sides of the timber ties. Anchorage of the rail prevents the rail from running, or moving in a longitudinal direction down the track, due to thermal expansion or train acceleration/braking loads. The anchors transmit the longitudinal stress forces in the rail to the ties, which then transmit the forces to the ballast thereby restraining movement of the track structure. Anchors are used on both sides of every other tie on main track, branch lines, yard tracks, set-out tracks and interchange tracks where the curvature does not exceed 3 degrees. Anchors are used on both sides of every tie for curves 3 degrees or greater and for 200' on each end of grade crossings (those costs are included in the grade crossing and turnout costs). The anchoring pattern being used on the DRR is consistent with AREMA and NS standards.[84]

The total costs for plates, spikes, and anchors are $855 million.[85]

iii. <u>Derails and Wheel Stops</u>

Derails are used to keep cars from rolling from a spur track or side track through a turnout and onto the main track. Derails are included at all Failed Equipment Detectors ("FED"), set-out track turnouts and at yard turnouts at the yard locations where cars are set out from trains and stored. Wheel stops are used at the end of single ended tracks to keep the cars from rolling off the end of the track. The cost for derails and wheels stops were developed from vendor price catalogues. The total costs for derails and wheel stops for the DRR is $1 million.[86]

[84] *See* e-workpaper "Rail Anchor Pattern.pdf."

[85] *See* e-workpaper "Track Construction Costs.xls."

[86] Id.

iv. Materials Transportation

As described above, specific transportation costs associated with a given item are included in the total costs for that item. Therefore, no additional transportation costs have been added.

v. Track Labor and Equipment

The DRR's track laying and related costs are derived from direct quotes and bids obtained from contractors on projects where Crouch Engineering bid and oversaw rail construction, and from recent quotes solicited from contractors for similar projects. Labor quotes for track construction were obtained from Queen City Railroad Construction and RailWorks. Bid prices were also obtained from several NS track construction projects. The lowest quote/bid has been used for track construction and includes the following:

- Provide labor to unload and distribute all track material including 136 RE CWR or 115 RE CWR from rail train, timber crossties, tie plates, rail anchors, spikes, and ballast
- Construct track complete using CWR, crossties on 21" centers, box anchoring every other tie, box anchor every tie within 200' of grade crossings
- Distribute ballast from hoppers or ballast cars
- Surface and line track, regulate ballast, 12" of ballast under center of ties

The total cost of track labor for the DRR is $1,562 million.[87]

The total cost of track construction for the DRR is $8,273 million.

4. Tunnels

The tunnel inventory and tunnel lengths were derived from materials provided by NS in discovery.[88] Consistent with Board precedent, DRR's engineers utilized the base unit cost of

[87] *See* e-workpaper "Track Construction Costs.xls."

$2,561 per linear foot ("LF")[89] indexed to 2Q09 levels. This procedure yields a unit cost of $7,280 per LF. The unit cost was multiplied by the total feet of tunnels (60,962.5 LF) to yield a final tunnel cost of $444 million.[90]

5. Bridges

DuPont's bridge testimony is also sponsored by witness Harvey Crouch. DuPont's engineers have observed bridges on many of the lines being replicated by the DRR and reviewed the specific information contained in NS's bridge inventory. Bridge quantities for the DRR were developed from NS bridge inventory information provided in discovery. Bridge designs were developed by DuPont's engineers and unit costs are derived from various real world sources as described below.

a. Bridge Inventory

Mr. Crouch prepared the bridge inventory for the DRR based on a review of the bridge information provided by NS in discovery. The bridge inventory utilized by DuPont's engineers includes milepost, feature crossed, number of spans, structure type, and total length.[91] Bridges spanning 20 feet or less and crossing natural barriers have been built as culverts.[92]

b. Bridge Design and Cost Overview

When the NS lines replicated by the DRR were constructed, a variety of bridge types and lengths were used. This was due to the different technologies that were available at the time of original bridge construction, the proclivities of the particular railroad company that constructed

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[88] *See* e-workpaper "DRR Tunnels.xlsx."

[89] *See Coal Trading Corp.* at 422.

[90] *See* e-workpaper "DRR Tunnels.xlsx."

[91] *See* e-workpaper "Bridge Construction Costs.xls."

[92] *See* e-workpaper "Culvert Construction Costs.xls."

the bridge, the desired load rating, and the available materials. As technology has become more sophisticated, so has bridge design and implementation.

The DRR's bridges have the same lengths as those being replicated, but DuPont's engineers have designed those bridges using more efficient spans where possible using several standard bridge designs (*e.g.,* Type I, II, III bridges) based on the diverse bridge lengths and heights that are required.[93] However, the bridge inventory provided by NS did not include complete and detailed bridge height data, only the maximum height. Therefore, to determine the necessary heights of the bridge being replicated, the following methodology was used based on the feature the bridge is crossing:

1.	Highway/Interstate	16.5' (AASHTO-Interstate Requirement)
2.	Other roads	14.5' (AASHTO-Other Highways)
3.	Navigable waterways	USCG clearance requirements[94]
4.	Other waterways	11'

These standard heights were adopted by DuPont's engineers in order to develop costs for the bridges required for the DRR. Bridge height is an essential aspect of the cost of a bridge. The higher the bridge, the more bracing will be required for stability, the more materials will be used, and the higher the construction cost will be due to the difficulty in forming concrete, driving longer steel piles, and lap-splicing rebar.

No information was provided in discovery on the hydraulic area of the bridges. Therefore, water flow increase/decrease was not taken into consideration in the engineer's methodology as this is negligible due to the fact that each bridge either kept the same number of spans, or had a decrease in span number, while keeping the length the same as the existing bridge.

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[93] This is standard practice in prior SAC rate cases. *See Duke/NS* at 109-110, *CP&L* at 95, *Duke/CSXT* at 95 and *WFA/Basin* at 108-112.

[94] *See* e-workpaper "USCG_Clearance_Guide.doc."

DuPont's engineers then developed a cost formula for each of the four bridge types using a composite of costs from Crouch Engineering's historical data of successful bidders on similar scale railroad bridge construction. The historical data includes the cost quotes from successful bidders for bridges built in rural Tennessee and rural Alabama with terrain very similar to that of the lines being replicated by the DRR. This project data focused on bridges that were not being built under traffic conditions or limited work windows, i.e., working conditions similar to those assumed to exist when building the DRR. Once they developed a standard cost formula, they then applied it to every bridge within the relevant category in the inventory. Each bridge is costed separately. The primary formula applied for each bridge, but separately by Type as needed is: Bridge Cost = [(Abutment cost X number of Abutments) + (Pier Cost X number of Piers) + (Per Linear Foot Cost x Length of Bridge)]. Other components such as piling, handrail, elastomeric pads, base plates, and PVC deck drains are also reflected in the costs.[95]

From a design standpoint, using Crouch Engineering's historical costs for building bridges ensures that all items necessary for building the bridges are included, especially since these historical costs are actual costs from real world applications thereby demonstrating the feasibility of the methodology. These bridges are adequate in design, and have a minimum rating of 286,000 pounds and a life cycle of 100 years (meaning that no major repairs will be required for 100 years).

The total investment cost for the DRR's bridges is $1,926 million and for highway overpasses is $9 million for a total of $1,935 million.[96]

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[95] *See* e-workpaper "Bridge Construction Costs.xls."

[96] *See* e-workapers "Bridge Construction Costs.xls," and Over Head Bridge Construction Costs.xls."

i. Type I Bridges

Type I bridges have varying spans of 20'-0" to 32'-0". These bridges are typically one span unless they are incorporated in the configuration of a much longer bridge requiring multiple bridge types and/or multiple span configurations. The same precast deck, column caps, abutment caps, and wing-walls are used for all of these bridges. The typical column uses 8-HP14x73 piles as the foundation and each abutment uses 6-HP14x73 piles as the foundation. Type I bridges less than 32' in length are single span structures; structures that are 32-55' are two spans. In addition, Type I spans were often used when approach spans were necessary due to the inconsistent span lengths on the bridge inventory list.[97]

ii. Type II Bridges

Type II bridges have spans of 32'-0" to 45'-0". These bridges are typically one span unless they are incorporated into the configuration of a much longer bridge requiring multiple bridge types and/or multiple span configurations. These intermediate spans are achieved by placing rolled beam sections next to each other. The same columns, abutments, caps, and wing-walls are used for all of these bridges. The typical column uses 8-HP14x73 piles as the foundation and each abutment uses 6-HP14x73 piles as the foundation.[98] The Type II Bridge classification on the DRR is reserved for single-span bridges between 32'-0" and 45'=0" in length, and on an occasional multi-span bridge requiring a shorter span.

iii. Type III Bridges

Type III bridges have spans of 60'-0" to 92'-6". These bridges are typically one span unless they are incorporated in the configuration of a much longer bridge requiring multiple

[97] Examples of the designs are included in e-workpaper "Type I Photos and Plans.pdf."

[98] Examples of the designs are included in e-workpapers "Type II_Photos and Plans.pdf," "BR01-Pier Typical.pdf," "BR02-Pier Typical Sections.pdf," "BR05-Type II-1.pdf," "BR05-Type II-2.pdf," "BR05-Type II-3.pdf," "BR05-Type II-4.pdf," "BR05-Type II-5.pdf" and "BR05-Type II-6.pdf."

bridge types and/or multiple span configurations. These intermediate spans are achieved by placing four 60' pre-stressed concrete Bulb-T beams side-by-side. A cast-in-place deck is installed over the pre-stressed Bulb-T beams. The same columns, abutments, caps, and wing-walls are used for all of these bridges. The typical column uses 8-HP14x73 piles as the foundation and each abutment uses 6-HP14x73 piles as the foundation.[99] The Type III Bridge classification on the DRR is reserved for single-span bridges between 60'-0"- 92'-6" in length, and on an occasional multi-span bridge requiring a longer span.[100] Type III Bridges are the most economical span, and, therefore, this is the span that was chosen for single-span bridges between 60'-0" and 92'-6" in length, and for multi-span bridges longer than 92'-6" (unless USCG restrictions are in-place).

iv. Type IV Bridges

Type IV bridges have spans of 150'-0", consist of a Steel Through Plate Girder, and can be comprised of multiple bridge types in order to achieve long multiple span structures. Type IV bridges were selected to cross over large rivers needing to comply with USCG clearance requirements. Along with the 150' spans, the vertical clearance of the bridge was set to 60' through the length of the river only.[101] Through Plate Girders were only chosen when USCG requirements were present and the structure consisted of the minimum of eighteen (18) 150' spans (totaling 2,700') or the length of the structure based on NS information provided in discovery. If eighteen 150' spans were used, it was necessary in some instances to have

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[99] Examples of the designs are included in e-workpapers "BR01-Pier Typical.pdf," "BR02-Pier Typical Sections.pdf," "BR06-Type III-1.pdf," "BR06-Type III-2.pdf," "BR06-Type III-3.pdf," "BR06-Type III-4.pdf," "BR06-Type III-5.pdf," "BR06-Type III-6.pdf" and "BR06-Type III-7.pdf."

[100] Examples of the designs are included in e-workpaper "Type III_Photos and Plans.pdf."

[101] Examples of the designs are included in e-workpapers "Type IV_Plans and Photos.pdf," "BR03-Pier USCG.pdf," "BR04-Pier USCG Sections.pdf," "BR07-Type IV-1.pdf," and "BR07-Type IV-2.pdf."

additional bridge types to extend the structure so as to keep it out of the floodplain. This is consistent with the information provided by NS in discovery.

v. Highway Overpasses

Grade separated crossings are included in the DRR bridge calculations. The DRR is constructing 151 such overpasses. As noted previously, the NS lines being replicated predate the roads in this territory. As such, DuPont has included 10 percent of the costs for such bridges consistent with Board precedent.[102]

The unit costs for highway overpass construction were derived from a composite list of costs that is tracked by various state Departments of Transportation.[103] Each bridge is costed separately based on the number of tracks being crossed and the state in which it is located. The DRR highway overpass bridges will be constructed with the required clearances as specified in AREMA Figure 28-1-6. A sketch and photo of the typical highway overpass is shown in DuPont's workpapers.[104] The total cost for highway overpasses on the DRR is $ 9 million.

6. Signals and Communications

The DRR will rely on a standard CTC-based vital signal system with components added to provide Positive Train Control ("PTC"). It will rely on a microwave system for communications. The signal system, including PTC, and communication system costs are sponsored by witness Victor Grappone, PE.

a. PTC Signal System

The Rail Safety Improvement Act of 2008 (RSIA) (signed by the President on October 16, 2008, as Public Law 110-432) has mandated the widespread installation of PTC systems by

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102 *See AEP Texas* at 102-103.

103 *See* e-workpaper "Over Head Bridge Construction Costs.xls".

104 *See* e-workpapers "BR09-Single Track Overpass.pdf" and "BR09-Double Track Overpass.pdf."

December 2015. The DRR network employs a PTC system for all train control and communications on the entirety of its constructed track network (i.e., the DRR does not include investment cost for signaling and communications system on trackage rights and joint facility tracks owned by other carriers).

Unlike existing Class I carriers, the DRR is installing a PTC system from the outset of its construction and investment, rather than converting an existing train communications and control system to a PTC system. As a result the investment expenditures by the DRR are less than what an existing Class I carrier will incur to achieve the same level of infrastructure. To develop the cost of the PTC system, DuPont's experts relied on information provided by NS in discovery related to its estimates of the costs of the various components of the PTC system. The costs were adjusted, where appropriate, to reflect the cost of a PTC system as an initial installation rather than conversion from an existing CTC or other signaling system.

PTC investment costs are included for three basic components, which include track (wayside), information technology systems and locomotive communications. Signal system costs, including the costs for the wayside and information technology portions of PTC, are contained in DuPont's workpapers.[105] This file contains a description of the components that comprise the system plus a count of the components and assigns unit costs for material and labor. The number and type of components associated with typical installations along the right of way are defined. The number of each type of installation was identified based on the layout of the DRR as manifested in the DRR stick diagrams and the track charts provided by NS in discovery.

DuPont counted interlocking components for huts ("IH"), signals ("IG"), switches ("IW") and track circuit ends ("IT"). For interlocking huts, a standard end-of-siding layout was taken as a baseline. To account for the additional costs associated with larger interlocking, a scaling

[105] *See* e-workpaper "DuPont C&S estimate.xlsx."

factor was included that takes into account the number of signals, switches and track circuit ends. For automatic signal locations, either single or double track installations ("AS1" or "AS2") were counted.

DuPont has also included costs to cover active highway crossing gates and flashers where needed. The count of crossings based on the numbers of track (one to four) and whether a given crossing had gates and flashers or just flashers ("X1G", "X1F", "X2G", "X2F", etc.) was based on information provided by NS in discovery.[106] Consistent with the Board's decision in *Duke/CSXT*, DuPont's engineers have included 10 percent of the costs for highway crossing protection signals.

b. <u>Detectors</u>

Automatic roll-by failed equipment detectors ("FEDs") are included along the DRR main lines as required by operations and consistent with the current industry standard.[107] These FEDs are located approximately every 35 miles along the main line (one for each main track in areas with two or more main tracks). Bad order setout tracks have been sited within two miles of the failed equipment detectors in each direction to provide for train stopping distances and allow removal of bad order cars to the setout tracks. All setout tracks near the detectors are single-ended tracks, 735 feet in length providing 600 feet in the clear past the switch. For interface to the signal and PTC system, each setout track is provided with either a single- or double-track ("EL1" or "EL2") electric lock manual switch installation. Costs for FED and electric lock locations are contained in DuPont's workpapers.[108]

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[106] *See* e-workpaper "DuPont C&S estimate.xlsx," tab "Crossings."

[107] *See* AREMA 2001 Standards, Chapter 16, Section 5.3.1, Items j & k.

[108] *See* e-workpaper "DuPont C&S estimate.xlsx."

The SFRR has 108 AEI scanners. Details of the costs and components are shown in DuPont's workpapers.[109]

c. Communications System

The DRR's railroad radio system enables locomotive communications, two-way radio communications, general voice communications, general data communications, and FED alerts. Microwave radio technology is used for the radio system backbone and land mobile radio technology is used to facilitate communications between end user applications and the radio system backbone. Land Mobile Radio ("LMR") technologies provide communication access (via fixed, mobile and portable radios) to the radio system backbone for operating crews, supervisory and track maintenance personnel that need to communicate with the railroad=s operating headquarters and central dispatching facility at Roanoke, VA. LMR technologies are co-located with microwave radio technologies at network (tower) sites if appropriate. LMR technologies operate in Very High Frequency ("VHF") mode to accommodate railroad operational frequencies assigned by the AAR.

The backbone of the DRR=s railroad radio system includes microwave towers along the DRR route.[110] The use of microwave towers for railroad communications is widespread, although fiber optic communications are now also being used. On average, microwave towers are placed at 20 mile intervals along the DRR.

Each tower includes a full set of microwave equipment, including two microwave base stations enabling sending and receiving along a straight path, and four microwave antennas. End towers have only one microwave station and two antennas. Where necessary, a tower may have

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[109] *Id.*

[110] *See* e-workpaper "DuPont LMR cost development.xls."

three or four base stations and six or eight antennas. Each microwave tower also includes a LMR base station, with corresponding radio equipment. Finally, each tower includes the necessary communications shed.

The type of multiplexor deployed at each site network (tower) site is the Alcatel 1518 Integrated Access Device ("AD"). The 1518 AD is rack-mountable and will convert analog RF signals from/to digital signals. The 1518 AD also interconnects with the MTR2000 LMR base station by standard Plain Old Telephone System ("POTS") four wire. The 1518 AD will also interconnect with the Alcatel MDR-8606 microwave base station by standard DS1 cable and shall conform to Telcordia TR-TSY-000499 and ANSI T1.102 standards. The 1518 AD supports up to 24 PCM channels per digroup that are intermixed at random, providing voice frequency ("VF") trunking, special service interfaces, synchronous and asynchronous data channels, program/broadcast services and FCC registered channels in one assembly.

CTC infrastructure components that are radio-enabled (*e.g.*, AEIs and FEDs) are equipped with the Kenwood TK-762GK radio, KAP-1 switching unit and required cables. For technical descriptions of the Kenwood TK-762GK VHF radio see DuPont's workpapers.[111] This mobile radio is VHF capable and operates in the 148-174 Mhz frequency range.

In addition to the radios handling CTC infrastructure, DuPont's engineering experts have included 1,661 LMR repeating stations positioned along the right-of-way. These LMR repeaters allow for uninterrupted RF communications along the right-of-way because the LMR stations on the microwave tower may or not be accessible at all points. Many of the LMR repeaters include a 30-foot antenna to extend the range.

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[111] *See* e-workpaper "Radios.pdf."

The costs for the locomotive communications component of PTC are also included in the DRR's communications system costs. Total investment cost for the DRR's communications system is $277 million.[112]

Total signals and communications system costs are shown in Table III-F-8 below.

Table III-F-8
Signals And Communications System Costs
($ millions)

Item (1)	Cost (2)
1. Signals System	$1,329
2. Communications	277
3. Total	**$1,606**

7. Buildings and Facilities

DuPont's buildings and facilities testimony is also sponsored by witness Harvey Crouch. The DRR's major system facilities are located at its six (6) major yards.[113] These facilities include the DRR's headquarters building, crew facilities, yard offices, locomotive repair shops, 1,000 and 1,500-mile inspection facilities, and car and locomotive storage. Additional, smaller yards are located throughout the DRR system.[114] The total building and facilities costs are summarized in Table III-F-9 below.

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[112] *See* e-workpapers "DuPont C&S Estimate.xlsx," and "PTC Locomotive Cost.xlsx."

[113] Elkhart, IN; Conway, PA; Roanoke, VA; Chattanooga, TN; Atlanta, GA; and Bellevue, OH.

[114] *See* e-workpaper "DRR Yard Matrix.xlsx."

Table III-F-9
Buildings And Facilities

Facility (1)	Cost (000) (2)
1. Headquarters Building	$3,074
2. Fueling Facilities	16,939
3. Locomotive Shops	12,380
4. Car Repair Shop	0
5. Crew Change Facilities	7,222
6. Yard Offices	1,533
7. Roadway Buildings (MOW)	3,818
8. Wastewater Treatment	5,706
9. Other Facilities/Site Costs	181,849
10. Total Buildings and Facilities	$232,521

Source: *See* e-workpaper "DRR Facilities Cost.xlsx."

a. Headquarters Building

The DRR headquarters is located at the DRR's Roanoke Yard. The DuPont engineers calculated the required square footage using the American Institute of Architects standards square footage per employee which includes additional space for work rooms, IT equipment, hallways, bathrooms and mechanical services. Executive employees were allotted additional space per those same standards. The resulting building is two stories with a total of 20,000 square feet.[115] The building's costs were based on RS Means online square foot cost calculator for building structures of this kind.[116] The total cost of the headquarters building is $3.1 million.

b. Fueling Facilities

i. Fueling Platforms and Fueling by Truck

Fueling platforms are located at all six major yards. Locomotive fueling at all other locations is performed by trucks (i.e., direct-to-locomotive or DTL fueling). All fueling by truck will be performed track-side. The yard tracks where locomotive fueling by truck will occur are

[115] *See* e-workpaper "DRR Facilities Cost.xlsx."

[116] *See* e-workpaper "DRR Facilities Cost.xlsx," tab "HQ Bldg."

built on 25-foot track centers, thereby providing sufficient space for the trucks to operate. The cost for fueling facilities on the DRR equals $16.9 million.[117]

ii. Lube Oil & Sanding

Locomotive servicing tracks designed for fueling locomotives by truck and including sanding and lube facilities are located in DRR yards in order to provide such services as needed.[118] These costs are included in each yard site based on the unit costs for the necessary facilities (including any needed storage tanks) derived from bid tabulations of projects with similar scope and size.

c. Locomotive Shop

At the Elkhart, Conway, Roanoke and Chattanooga yards, DuPont's engineers have included a locomotive shop designed to handle overhaul work as well as 92-day inspections and running repairs. Each shop includes a two-track facility designed to handle 92-day inspections and other minor running repairs as required and includes such necessities as a pit. Three additional tracks capable of holding up to ten (10) locomotives are included for the larger overhaul work. The heavier work-track design includes overhead and jib cranes, drop tables and other necessary heavy equipment as required based on the function of each track.[119] In addition, the shop is equipped with a wheel turning machine and other heavy equipment.[120]

Unit costs and designs are based on actual locomotive shop facilities designed and constructed by Crouch Engineering. Details of the shop fixtures and costs are included in DuPont's workpapers.[121] The total cost for locomotive shops for the DRR is $12.4 million.[122]

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[117] *See* e-workpaper "DRR Facilities Cost.xlsx."

[118] *See* e-workpaper "DRR Yard Matrix.xlsx" for the locations of these facilities.

[119] All items included in the design of the DRR locomotive shops are separately priced.

[120] *See* e-workpaper "DRR Facilities Cost.xlsx," tab "Major."

[121] *See* e-workpapers "DRR Facilities Cost.xlsx" and "Locomotive Shop.pdf."

d. Car Repair Shop

As noted in Section III-C, the DRR acquires its railcars via full service leases and therefore, the lessor, and not the DRR, is responsible for providing all necessary car repair shops.[123] Consequently, Dupont's experts have not included costs for any car repair facilities. However, they have provided the necessary space and tracks for such a facility at the DRR's Conway and Atlanta Yards.

e. Crew Change Facilities

There are 67 crew change locations on the DRR which require a crew change facility.[124] The buildings at the six major yards, which have the higher number of crew starts per day, are sized 35' by 64' for a total of 2,240 square feet per building. The buildings at the other locations are sized 25' by 56' for a total of 1,400 square feet per building. These buildings generally replicate the buildings used by NS for such purposes. Based on Mr. Crouch's experience, NS utilizes a variety of structures for crew change locations including old depots, metal buildings and concrete block buildings. Each building includes basic facilities such as locker rooms, a break area, a work room and other necessities. The unit costs and designs are based on actual buildings designed by Crouch Engineering. The total cost for crew change facilities on the DRR is $7.2 million.[125]

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122 *See* e-workpaper "DRR Facilities Cost.xlsx."

123 *See PSCo/Xcel* at 113, *CP&L* at 113; *Duke/NS* at 118.

124 Some crew change locations do not require a facility as the crew is away from home and goes directly to a motel upon going off duty.

125 *See* e-workpaper "DRR Facilities Cost.xlsx."

f. Yard Offices

There are 42 yard offices, one at each of the DRR's yards where there are car inspectors, yard crews or transportation department field personnel. These buildings are 25' by 56' and are pre-engineered metal buildings. The total cost for yard offices on the DRR is $1.5 million.[126]

g. Maintenance of Way Buildings (Roadway Buildings)

The DRR has 36 MOW buildings. Each building is similar in office space and design to the crew change facilities, but the interior is smaller as there are fewer employees using the space. Additional area is provided for garaging certain vehicles as necessary and storing MOW supplies. DuPont's engineers developed the space requirements based on the typical MOW crew located in each location as well as the need to house signal maintainers. The unit costs and specifications were derived from actual MOW buildings designed by Crouch Engineering. The total cost for MOW buildings on the DRR is $3.8 million.[127]

h. Wastewater Treatment

The DRR building facilities are located near existing towns and cities, and are able to be served by a local sewer connection or similar service. DuPont's engineers, therefore, included costs for sewer tie-ins. In addition, in order to handle runoff from various work by-products (*e.g.*, oil) before reaching the public sewer system, DuPont's engineers have included oil/water separators. The effluent is then sent to an oil/water vaporizer which produces a dry powder that can be easily disposed of. DuPont's engineers have utilized such facilities in projects for other railroads. The total cost for wastewater treatment on the DRR is $5.7 million.[128]

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[126] *Id.*

[127] *See* e-workpapers "DRR Facilities Cost.xlsx" and "MOW Building.pdf."

[128] *See* e-workpaper "DRR Facilities Cost.xlsx."

i. Other Facilities / Site Costs

DuPont has also included costs for other facilities and site preparation costs. These costs include costs for automobile handling facilities, locomotive servicing areas in certain DRR yards, yard lighting, yard drainage and other site preparation costs. DuPont has included $182 million for these items.[129]

8. Public Improvements

DuPont's public improvements testimony is also sponsored by witness Harvey Crouch. While public improvements are discussed in detail below, the costs for some of items were included in other investment categories, such as buildings and facilities and signals.

a. Fences

NS did not provide any data concerning the quantities or locations of fencing on any of the lines being replicated by the DRR. Consequently, DuPont has relied on its experts' experience and observations that the vast majority of the lines being replicated are not fenced. Moreover, the fencing that was observed tended to be for farm, industrial, or residential use, and given the variations in materials, such fencing appears to have been erected by the adjacent land owner. Therefore, DuPont has included fences only for its yards.[130]

b. Signs

DuPont's operating and engineering experts have included a standard package of railroad signs, including milepost, whistle post, yard limit, and cross-buck signs and posts. DuPont has included $8 million for railroad signs.[131]

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[129] Id.

[130] Id.

[131] *See* e-workpaper "Track Construction Costs.xls."

c. Highway Crossings and Road Crossing Devices

The DRR is building all at-grade crossings, and paying 100 percent of the cost for the crossing materials. DuPont has included $105 million for at-grade crossings.[132] Consistent with *Duke/CSXT* and *AEP Texas*, DuPont has included 10% of the costs associated with crossing protection, such as gates, flashers, and related signal elements such as crossing predictor huts.[133] These costs are included with the signals costs described in Part III-F-6 above.[134] For grade-separated crossings, the DRR is paying for 10 percent of the total investment costs in such structures[135] resulting in $9 million. These costs and designs are discussed in Part III-F-5 above.

9. Mobilization

DuPont's engineers have added a 2.7% mobilization factor for all items where mobilization is not already included in the contractor's bid.[136] The total cost for mobilization on the DRR is $448 million.

10. Engineering

The Board has used a 10 percent estimate for all engineering cost components.[137] Thus, DuPont's engineers have used a 10 percent additive here to cover all engineering, construction management, and resident inspection costs, as well as other items such as soil testing. The total cost for engineering on the DRR is $1,658 million.

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[132] *See AEP Texas* at 102 and *PSCo/Xcel* at 115-116. *See* e-workpaper "Track Construction Costs.xls".

[133] *See Duke/CSXT* at 105.

[134] *See* e-workpaper "DuPont C&S Estimate.xlsx."

[135] *See WFA/Basin* at 130 and *Duke/CSXT* at 105.

[136] *See Duke/CSXT* at 106. The STB accepted 2.6% in *CP&L* (at 107) and 2.5% in *Duke/NS* (at 123). The STB also accepted 2.4% in *AEPCO* (at (132). DuPont is being conservative by using 2.7% for mobilization.

[137] *See PSCo/Xcel* at 118.

11. Contingencies

Consistent with prior Board decisions in other SAC rate cases,[138] DuPont's engineering experts have used a 10 percent contingency factor and applied it to the construction subtotal excluding land. Total contingency costs for the DRR are $1,869 million.[139]

12. Other

a. Construction Time Period

The construction time period for the DRR is controlled by the time it takes to construct the Lake Pontchartrain Bridge located near the city of New Orleans, LA.

The work will begin with the start of surveying and aerial mapping operations. A two month period will be allocated to obtain sufficient information to allow preliminary planning and engineering design to begin. Design of the railroad and appurtenances will require a fourteen month period including the two-month start up/surveying period.

Land acquisition will take approximately seven months to complete. It will commence five months after project initiation. Test borings will be timed to coincide with land acquisition so sufficient test borings can be made during the design process.

By the tenth month at about 70 percent completion of the design phase, the longest bridge, the Lake Pontchartrain Bridge, will be bid with construction to start by the thirteenth month. The remaining site work bid packages will be ready to bid in the eleventh month and work on all site work, bridges and tunnels will be started by the fifteenth month. In the twelfth month, the PTC, signal, communications and track packages will be bid.

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[138] *See WFA/Basin* at 132-133; *AEP Texas* at 104-105; *Xcel* at 118 (parties agreed to 10 percent contingency); *TMPA* at 746-747; *West Texas Utilities* at 710; *APS* at 402.

[139] *See* e-workpaper "III-F Total.xls."

Construction of all bridges and structures other than the Lake Pontchartrain Bridge is anticipated to take a maximum period of twelve months. It is expected that the Lake Pontchartrain Bridge can be constructed in fourteen months.

In general, the construction work has been planned by subdivision. The work has been structured so that all site work and bridges and tunnels can be completed prior to installation of track and signals. Total construction time for the N.O. & N.E. District, which will take the longest to construct, will be twenty months. Total design and construction time for this project is twenty-eight (28) months with six (6) months (of which four (4) months overlap construction) available at the end of construction for final operational testing. Thus a thirty (30) month overall construction period has been provided.

The DRR construction project would be divided into 102 track packages, 365 grading packages, 675 bridge packages, 62 tunnel packages and 11 building packages.[140]

Track gangs will lay track at an average of one-half mile per day, ballasted and anchored. With crews working six days per week, the rate of one half mile per day would enable the project to be completed within the established schedule.

Finally, material prices have been obtained for most track materials delivered to railheads, including, but not limited to, East St. Louis, IL, Atlanta, GA, Chattanooga, TN, Charlotte, NC, Roanoke, VA, Harrisburg, PA, Fort Wayne, IN, Birmingham, AL, New Orleans, LA, Columbus, OH and Pittsburgh, PA. Because of the numerous road access points along the lines, the uniform topography for most of the railroad, and interstate roads paralleling many line segments, materials that cannot be shipped by rail have been priced with shipping by truck to one or more of the road access points along the DRR's lines.

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[140] *See* e-workpaper "Complete Construction Schedule.xls."

Part III-G

III. G. DISCOUNTED CASH FLOW ANALYSIS

The expert witnesses responsible for this part are Thomas D. Crowley and Daniel L. Fapp of L. E. Peabody and Associates, Inc. Their credentials are detailed in Part IV.

The Board's SAC constraint rests on the premise that a captive shipper should pay no more than the minimum necessary to receive service from a least-cost, presumptively efficient replacement for the incumbent railroad, and that the shipper should not bear the cost of any facilities or services from which it derives no benefit.[1] The SAC constraint is derived from and constitutes an application of the theory of contestable markets.

In the Board's contestable market structure, the incumbent railroad's rates are deemed constrained by the threat of entry by the hypothetical stand-alone entity. If it is shown that the prospective cost of substitute service is less than the rate charged by the incumbent, there is an incentive for the new entity to enter. The presence of that incentive, in turn, is evidence that under the incumbent's rates the shipper is contributing to (subsidizing) the cost of services that it does not use, and/or is contributing monopoly profits to the incumbent.

SAC provides a regulatory ceiling on rates under conditions of rail market dominance; if the incumbent's rates are higher than those that would be charged by the stand-alone entity (the DRR in this case), then the incumbent's rates are unreasonable. As the Board summarized in *CP&L*:

> A SAC analysis seeks to determine the lowest cost at which a hypothetical, optimally efficient carrier could provide the service at issue free from any costs associated with inefficiencies or cross-subsidization of other traffic. A stand-alone railroad is hypothesized that could serve the traffic if the rail industry were free of barriers to entry or exit. (It is such barriers that can make it possible for railroads to engage in monopoly pricing absent regulatory constraint.) Under the SAC constraint, the rate at issue cannot be higher than what the SARR would need to charge to

[1] *See Coal Rate Guidelines*, 1 I.C.C. 2d at 523-524; *AEPCO* at 3-4.

> serve the complaining shipper while fully covering all of its costs, including a reasonable return on investment.[2]

Since the function of a SAC analysis is to identify the cost associated with providing the most-efficient, least-cost service to the captive shipper, it follows that application of the SAC standard should be premised on rational economic behavior by the stand-alone entrant. In particular, the stand-alone entrant should pay no more than is necessary for its inputs. While the DRR is considered to be a substitute for NS to the extent of the scope of the DRR's planned services, SAC does not require that the DRR replicate the NS system in all respects. As the Board's predecessor confirmed in *Coal Rate Guidelines*, the design of the stand-alone system and the traffic it carries are chosen to achieve the goals of maximizing revenues and minimizing service costs to the shipper, regardless of the actual circumstances of the incumbent railroad.[3] This means that the DRR must be considered a replacement for the relevant portions of the NS system, not a rival, and must be afforded the flexibility to configure its system and service scope in a manner that maximizes efficiency and cost effectiveness.[4]

These core principles guide the traffic group, design, configuration, and planned operation of the DRR as detailed in the previous Parts of this Testimony. They also inform the proper treatment of capital cost recovery, inflation and taxes.

1. <u>Cost of Capital</u>

Calculation of the capital recovery charge for the DRR necessarily depends on the DRR's assumed cost of capital. While the Board has expressed a willingness to consider alternative approaches to estimate this assumed cost, the Board has consistently only accepted the general railroad industry's average costs of common equity, debt and preferred equity (if any), and their

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[2] *See CP&L* at 11.

[3] *See Coal Rate Guidelines* at 543-544.

[4] *See, e.g., Nevada Power II,* at 280-281 (Chairman McDonald, commenting).

percentage mix within the industry's capital structure,[5] in forming a capital structure for the SARR over the relevant construction period (December 1, 2006 through May 31, 2009 in this case) and operating period (June 1, 2009 through May 31, 2019).[6]

The DRR's cost of debt and preferred equity[7] capital during the 10-year DCF period is assumed to equal the weighted average railroad industry cost of debt or preferred equity over the DRR's construction period, weighted upon the DRR's investment by construction year. The cost of common equity capital is assumed to equal the then-current year railroad industry cost of equity as determined by the Board. If the Board has not calculated the cost of equity capital for such year, the simple average of all prior years' costs of equity capital beginning in the first year of the SARR's construction is used. To project capital costs forward and estimate the value of the DRR at the end of the DCF period (June 1, 2018 through May 31, 2019 is the last annual period in the DCF model), the Board relies on an average of available past years' industry capital costs, reaching back to the first construction year.[8]

DuPont has followed the Board's approved and preferred approach in developing capital costs for the DRR. For 2006, 2007, 2008, 2009, and 2010 DuPont employs the industry average costs determined by the Board in its annual cost of capital proceedings.[9] DuPont uses the railroad industry cost of capital to calculate the capital recovery charges for all road property investment.

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5 As determined by the Board in its annual railroad cost of capital proceedings.

6 *See WFA/Basin* at 135; *Duke/NS* at 37; *CP&L* at 28.

7 The STB's annual cost of capital findings since calendar year 2002 have not included preferred equity.

8 *See AEP Texas* at 108-109.

9 *See STB Ex Parte No. 558 (Sub-No. 10) Railroad Cost of Capital – 2006,* decided April 14, 2008, *STB Ex Parte No. 558 (Sub-No. 11) Railroad Cost of Capital – 2007,* decided September 24, 2008, *STB Ex Parte No. 558 (Sub-No. 12) Railroad Cost of Capital – 2008,* decided September 24, 2009, *Ex Parte No. 558 (Sub-No. 13), Railroad Cost of Capital – 2009,* decided October 28, 2010, and *Ex Parte No. 558 (Sub-No. 14), Railroad Cost of Capital – 2010,* decided September 30, 2011. The railroad industry had no preferred equity capital outstanding. Therefore, the DRR incurs no cost of preferred equity for these years.

2. Inflation Indices

The prices of goods and services used by the DRR undoubtedly will change over the 10-year DCF period. It therefore is necessary to forecast rates of inflation for application to the capital assets and operating expenses over the timeline covered by the SAC analysis; *i.e.* June 2009 through May 2019. The time path of capital recovery charges for the DRR likewise must maintain the real purchasing power of those charges. A summary of the indexes applied to the DRR's capital assets and operating expenses is shown in Table III-G-1 below.

Table III-G-1
Index Values Utilized In The DRR DCF Model

		Index Value			
Year	**Land**	**Materials and Supplies**	**Wage Rates and Supplements**	**Materials, Supplies, Wage Rates and Supplements (Excluding Fuel)**	**Operating Expenses**
(1)	(2)	(3)	(4)	(5)	(6)
2006	100.0	100.0	100.0	100.0	---
2007	107.1	104.8	103.4	103.4	---
2008	113.6	116.0	108.0	109.0	---
2009	107.3	123.5	112.2	113.6	100.0
2010	107.1	123.8	120.3	120.7	114.9
2011	112.7	128.0	122.4	123.1	125.8
2012	119.5	136.7	127.7	128.8	129.2
2013	127.2	141.0	135.3	136.1	134.9
2014	135.4	144.3	139.8	140.3	136.7
2015	144.1	148.3	145.7	146.0	139.3
2016	153.5	151.5	151.3	151.4	141.7
2017	163.5	153.9	156.9	156.7	143.3
2018	174.1	156.3	162.8	162.1	145.1
2019	182.6	158.2	167.3	166.2	146.4

Sources: Opening e-workpapers "DRR Land Appreciation.xls," "Hybrid RCAF.xls," and "Exhibit III-H-1.xls."

The annual inflation forecast that is used to calculate the value of the DRR's road property assets is based on actual railroad chargeout prices and wage rate indexes calculated by the AAR for materials and supplies, wage rates and supplements, and materials prices, wage rates, and supplements combined (excluding fuel) ("MWSExFuel") for eastern railroads, and the current Global Insight's March 2012 Rail Cost Adjustment Factor Forecast for rail labor and rail materials and supplies.[10]

For land assets, the annual forecast inflation rate is based on a weighted combination of indices that reflect rural and urban land prices in proportion to the mix of the land values on the DRR system routes.[11]

Rural land indexes were developed from historic rural land values reported by the U.S. Department of Agriculture ("USDA"). The STB determined in *AEPCO* that it is preferable to use a longer rather than a shorter period of historic data when forecasting future economic trends, such as an inflation rate for land values.[12] The STB cited its use of historical averages of more than 80-years in developing railroad costs of equity estimates.[13] Given the STB's clear preference for longer historical averages, and the use of averages from the late 1920's to 1930 to calculate the DRR's cost of equity, we developed the historic average annual and quarterly percentage change in rural land values between 1930 and 2011 for the DRR states, and used these historic averages to forecast future changes in rural land values.[14]

Urban land values, which are assumed to consist of a mix of investment, residential and commercial properties, were indexed using a commercial land index prepared by the National

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[10] Global Insight does not develop a forecast of the AAR's MWSExFuel index. DuPont therefore uses a proxy that weights Global Insight's materials and supplies and labor rate index forecasts, which the Board has relied upon for purposes of execution of the DCF model. *See AEP Texas* at 109; *Duke/NS* at 37; *CP&L* at 28.

[11] Historically, parties in SAC cases weighted the different urban and rural land indexes based upon the percentage of SARR acres which were urban and rural. In *AEPCO*, the STB changed its approach to weight the indexes based on the value of the rural and urban land acquired by the SARR. DuPont has applied the STB's revised approach in its opening DCF model. *See AEPCO* at 139.

[12] *See AEPCO* at 139.

[13] *See* AEPCO at 139 "In measuring the terminal growth rate (from year 11 out) in the cost of equity, the Morningstar/Ibbotson model uses, in part 'the average annual percentage change in real GDP from 1930 to the year being analyzed." Similarly, in developing the Capital Asset Pricing Model ("CAPM") cost of equity, the STB relies upon the historic average equity risk premium calculated from the year 1926 to the present. See STB Ex Parte No. 558 (Sub-No. 10), *Railroad Cost of Capital -- 2006*, served January 17, 2008.

[14] For the years 2006 through 2011, DuPont relied upon the actual change in rural land values instead of the historic average.

Council of Real Estate Investment Fiduciaries ("NCREIF").[15] In *AEPCO,* the parties used the change in historical commercial property indexes developed by the Massachusetts Institute of Technology Center for Real Estate ("MIT") to forecast expected urban land inflation. However, MIT only produces the historic indexes on a national level, and for the South, East and West Regions, but not the Midwest Region.[16] Since a significant portion of the DRR lies in Midwestern states as defined by MIT and NCREIF, including Ohio, Michigan, Indiana, Illinois, and Missouri, we sought to use a series of indexes that would cover all of the DRR states. The NCREIF Property Index ("NPI") met this criterion. The NPI is a quarterly time series composite index, which like the MIT index used in *AEPCO,* measures total rate of return of investment performance of a very large pool of individual commercial real estate properties acquired in the private market.[17] Unlike the MIT indexes, though, the NPI measures changes in commercial property for four (4) regions of the U.S., including the Midwest Region.

DuPont applied the NPI to urban land values in developing its land inflation index. For the years 2006 through 2011, DuPont used the actual change in NPI by region to index urban land values. For the years 2012 to 2019, DuPont calculated the long-term historic change in the NPI from 1978 (the first year reported) to 2011, and used this longer-term average as a proxy for future urban land value growth. This collection of forecasts and their application is shown on Exhibit III-H-1.

In *Major Issues*, the Board adopted a convention for the indexing of operating expenses for a SARR under which expenses for the first year would adjust based on 100 percent of the change in the RCAF-U; expenses for the second year would adjust based on 95 percent of the

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[15] Details are provided in e-workpaper "DRR Land Appreciation.xls."

[16] *See* "A Set of Indexes for Trading Commercial Real Estate Based on the Real Capital Analytics Transaction Prices Database," *MIT Center for Real Estate, Commercial Real Estate Laboratory – CREDL*, Release 2, September 26, 2007 ("MIT Real Estate White Paper").

[17] A complete description of the NPI can be found on the NCREIF website at http://www.ncreif.org/property-index-returns.aspx.

change in the RCAF-U and 5 percent of the change in the RCAF-A; and each succeeding year of the DCF period would use a mix reflecting increasing shares of the RCAF-A in 5 percent increments.[18] DuPont applies this method to the indexing of operating expenses for the DRR.[19] DuPont's model uses actual RCAF-U and RCAF-A indexes through 2Q12, the latest quarter available, and applies Global Insight's March 2012 RCAF-U and RCAF-A forecasted indexes thereafter.

3. <u>Tax Liability</u>

Federal taxes for the DRR are calculated on the assumption that it pays taxes at the 35 percent corporate rate, with all payments for debt interest, state income taxes and depreciation expenses treated as reductions in taxable income.[20] Interest expense is calculated on a 20-year period, pursuant to Board precedent. As explained in greater detail in Section III-H-1-d, DRR interest expense is calculated based on the real practice of railroads issuing primarily coupon bonds, which pay periodic, even interest payments. Depreciation expenses for tax purposes use accounting lives from the Modified Accelerated Cost Recovery System ("MACRS") with investments placed in service in the second quarter using a mid-quarter convention. In addition, as described in Part III-H-1-f, the DRR calculated bonus depreciation available under current tax laws.

The DRR also must account for any income tax liability accruing to the twenty (20) states in which it operates. Following Board-approved procedures for developing a weighted-average state income tax rate, the taxes applicable to railroads in each of these jurisdictions were

[18] Under the Board's hybrid approach, operating expenses for the tenth and final year of the DCF period would be determined using an index comprised of 55 percent of the change in the RCAF-U, and 45 percent of the change in the RCAF-A. *Id.* at 40.

[19] *See* e-workpaper "Hybrid RCAF.xlsx."

[20] *See FMC* at 847-848.

weighted together based on the DRR route-miles located within each jurisdiction.[21] As summarized in Table III-G-2 below and detailed in Exhibit III-H-1, the weighted average rates for each state produce an effective state tax rate of 6.54 percent for the DRR.

Table III-G-2
State Tax Rates And
Constructed Miles For The DRR

	State (1)	Tax Rate (2)	Route Miles (3)
1.	Alabama	6.5%	786.0
2.	Delaware	8.7%	38.1
3.	Georgia	6.0%	714.2
4.	Illinois	9.5%	740.4
5.	Indiana	8.5%	589.3
6.	Kentucky	6.0%	285.2
7.	Louisiana	8.0%	68.6
8.	Maryland	8.25%	92.8
9.	Michigan	4.95%	58.0
10.	Mississippi	5.0%	204.8
11.	Missouri	6.25%	201.6
12.	New Jersey	9.0%	88.1
13.	New York	7.1%	554.1
14.	North Carolina	6.9%	278.4
15.	Ohio	0.3%	887.7
16.	Pennsylvania	9.99%	795.9
17.	South Carolina	5.0%	312.2
18.	Tennessee	6.5%	544.7
19.	Virginia	6.0%	654.5
20.	West Virginia	8.5%	224.7
21.	Weighted Average	6.54%	

Source: Exhibit III-H-1

4. Capital Cost Recovery

Under the Board's DCF methodology, economic depreciation is used to calculate the capital recovery cost of the DRR's property. Economic depreciation effectively represents an asset's loss of earning power as it approaches the end of its life and/or its replacement date. The changes adopted in *Major Issues* dictate the use of a 10-year analysis period to benchmark the DRR's asset value. However, the DRR's investments would not be retired at the end of the 10-

[21] *See*, e.g., *Coal Trading Corp.* at 527.

year DCF period; rather, it is assumed that continuing investments will be made in the DRR, and that it would operate, hypothetically, in perpetuity. DuPont's calculation of SAC, in Exhibit III-H-1, therefore accounts for the costs associated with the renewed investments in and continued operation of the DRR after May 31, 2019, using the approach approved by the Board in previous cases.[22]

Beginning with *FMC* and continuing through subsequent decisions, the Board has utilized a real capital carrying charge that is equal in each year of the DCF period, regardless of changes in volume. Under this assumption, the relationship between stand-alone revenues and SAC (and, thus, the measure of potential rate relief and the maximum reasonable rate) fluctuates with annual changes in volume and associated revenue.[23] DuPont's computations of the pattern of capital recovery apply this approach.[24]

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[22] *See, e.g.*, *AEP Texas* at 105-106.

[23] *See WFA/Basin* at 134-135.

[24] *See* Exhibit III-H-1.

Part III-H

III. H. RESULTS OF SAC ANALYSIS

The expert witnesses responsible for this Part are Thomas D. Crowley and Daniel L. Fapp of L.E. Peabody & Associates, Inc. Their credentials are detailed in Part IV.

1. Results of SAC DCF Analysis

The results of the SAC DCF analysis conducted by DuPont are shown in Exhibit III-H-1. The calculations shown in each table of that Exhibit are summarized below.[1]

a. Cost of Capital

The cost of capital (Table A) for the DRR reflects the Board's annual cost of capital determinations for 2006 through 2010. The DRR's cost of debt for years 2006 to 2009, the DRR's construction period, is assumed to equal the railroad industry average cost of debt for each specific year in the construction period. For years 2010 through 2019, the DRR's cost of debt equals 6.32 percent and reflects the weighted average of the construction years' debt costs used through the remaining years of the DCF model. The DRR's cost of common equity for the years 2006 through 2010 is assumed to equal the railroad industry cost of common equity for each specific year. For years 2011 through 2019, the DRR's cost of common equity equals 12.47 percent, which, consistent with prior SAC cases, is equal to the simple average of the prior year costs of common equity. The DRR has no preferred equity.

b. Road Property Investment Values

The calculation of road property investment costs is summarized in Table C of Exhibit III-H-1. The investment cost also incorporates one-time fees paid for land easements.

[1] The cost of capital (Table A) and inflation indices (Table B) are addressed in Part III-G.

c. Interest During Construction

Interest During Construction ("IDC") accrues on the road property assets of the DRR. Table D shows the total IDC amount, and the portion that is debt-related. IDC is calculated based on the investment values in Table C, the composite cost of capital by year from Table A, and the assumed length of the finance period for each account. The construction schedule described in Part III-F-12 is used as the basis for the length of the finance period. The portion of IDC that is debt-related is calculated by multiplying the investment by the length of the finance period, the DRR's debt percentage, and the annual cost of debt for the year of investment. Debt-related IDC is shown as an interest deduction for tax purposes during the construction period.

d. Interest Schedule of Assets Purchased With Debt Capital

Parties in prior SAC proceedings have assumed that the hypothetical SARR's debt capital would mirror the debt issued by the U.S. Class I railroads included in the Board's annual cost of capital determination.[2] While the parties had incorporated the cost of the railroad industry debt reflected in the Board's annual determination, they implicitly deviated from the type of debt the railroad industry utilized in its capital structure. Both shippers and railroads assumed that the SARR would issue debt structured similar to a typical home mortgage loan, e.g., the SARR would make quarterly payments that contained a principal repayment component and an interest component. Over time as the debt was amortized, the interest component portion of the payment declined as larger amounts of the principal were repaid until, after 20 years, the debt was assumed to be completely repaid.

While such a payment stream is consistent with a typical home mortgage, it is contradictory to the payment schemes of the vast majority of railroad industry debt. Railroad

[2] *See West Texas Utilities* at 712.

companies, like other large corporations, do not customarily make periodic payments that contain constantly changing principal and interest components, but rather make coupon payments on the debt consisting of fixed interest payments. The AAR's filing in the 2010 cost of capital determination shows that nearly 90 percent of railroad industry debt consists of corporate bonds, notes and debentures that incorporate such periodic coupon payments.[3] In fact, the vast majority of NS' own debt is held in the form of corporate notes and debentures. According to the NS's 2011 SEC Report 10-K, $7.464 billion of NS' $7.540 billion total debt (after discounts and premiums) is held in notes and debentures paying coupon payments.[4] In other words, nearly 99% of NS total long-term debt pays fixed payments.

If Board precedent assumes that the SARR's cost of debt should mirror the railroad industry cost of debt, the SARR debt should also mirror the composition of that debt and how the interest is paid to the debt holders. To that end, instead of amortizing the debt in a mortgage-style approach over a 20-year schedule, DuPont has developed the quarterly coupon payments associated with the SARR's debt as depicted in Table E of Exhibit III-H-1.[5] The quarterly interest payment is developed by multiplying the fourth-root of the appropriate Table A cost of debt by the sum of the total investment and IDC for the year.

Consistent with *Major Issues* and previous Board decisions, the debt for road property investment is assumed to be financed over 20 years. The Board's assumption about the SARR issuing 20-year debt obligations may not match the actual length of debt obligations issued by the railroads in the cost of capital determination group. However, this is not a concern and need

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3 *See* the Verified Statement of John T. Gray in Ex Parte No. 558 (Sub No. 14), Railroad Cost of Capital – 2010, submitted April 29, 2011 at page 10 and Appendix A, which discuss the pricing of bonds based in part on their coupon payments and shows the coupon payments for the railroads' long-term notes and debentures. Mr. Gray submitted verified statements in the 2008 and 2009 Railroad Cost of Capital proceedings that show that the debt issued by the railroads in those years also primarily consisted of notes and debentures with coupon provisions.

4 *See* NS SEC Form 10-K for the Fiscal Year Ended December 31, 2011 at page K56.

5 Most railroad companies pay interest semi-annually, but to remain consistent with the structure of the Board's DCF model, DuPont has assumed the SARR will make coupon payments on a quarterly basis.

not impact the assumption of fixed interest payments. As explained more fully below, the railroads' level of debt has remained fairly level since the last round of mergers in the mid 1990's. This is because the railroads are issuing new debt as debt instruments mature, or as they redeem older debt issuance and replace them with newer issuances. In other words, the railroads are holding their levels of debt fairly constant, and as such, are consistently paying interest on this debt. Between 1998 and 2009, the four main railroads included in the STB's cost of capital calculation paid aggregate interest payments ranging in a narrow bank between $1.8 and $2.2 billion.

e. Present Value of Replacement Cost

Table F shows the additional investment (on a present value basis) that the DRR would have to make if each of its assets (excluding land) was replaced indefinitely at the end of its useful life. The 2006-2010 average cost of capital values are used to calculate replacement value for road property assets. This calculated investment is added to the initial investment in Table I prior to determining the quarterly cash flows.

f. Tax Depreciation Schedules

Table G displays the tax depreciation required under the Federal Tax Code as currently in effect.[6] Depreciation was calculated assuming a mid-quarter convention, with assets placed in service in the first quarter. Investments in communications (Account 26), signals and interlockers (Account 27), and the track accounts (Accounts 8-12) were depreciated over seven (7) years employing a 200 percent declining balance methodology, then switching to straight-line depreciation when the straight line percentage exceeds the declining balance percentage. Investments in bridges and culverts (Account 6), public improvements (Account 39), fences and

[6] The mandatory method for depreciating most tangible property placed in service after December 31, 1986 is MACRS. In addition, Engineering Costs have been amortized over a 60 month period, starting with the month in which the business begins.

roadway signs (Account 13), station and office buildings (Account 16), roadway buildings (Account 17), and shops and engine houses (Account 20) were depreciated over 15 years using a 150 percent declining balance method, and then switching to straight-line depreciation at the same point consistent with Board precedent. Investments in grading (Account 3) and tunnels (Account 5) were amortized over 50 years using straight-line amortization. Investments in engineering (Account 1) were amortized over five (5) years using straight-line amortization.

The DRR will take advantage of additional or "bonus" depreciation provisions enacted in 2008 and 2009. These provisions were part of the Economic Stimulus Act of 2008 ("Stimulus Act") and the American Reinvestment and Recovery Act ("ARRA") of 2009.[7] These acts provided bonus depreciation on capital investments with MACRS recovery periods of 20 years or less.[8] Qualifying investments are allowed a 50 percent depreciation bonus in the year that they are placed into service. Tax depreciation for the remaining 50 percent of the cost, or the remaining cost basis, is calculated using the standard MACRS schedules.[9] Because the DCF model assumes that all assets are placed into service in the first year of the 10-year DCF period, which in this case is 2009, the majority of the DRR's investment qualifies for the bonus

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[7] Congress also extended the 50 percent bonus depreciation available to businesses with the Small Business Jobs Act of 2010, which contained 50 percent depreciation bonus applicable to purchases made between January 1, 2010 through September 7, 2010. The Tax Relief, Unemployment Insurance Reauthorization and Job Creation Act of 2010 increased the bonus depreciation to an 100 percent depreciation bonus for capital investments placed in service after September 8, 2010 through December 31, 2011. For equipment placed in service after December 31, 2011 and through December 31, 2012, the law provides for 50 percent depreciation bonus.

[8] NS took advantage of bonus depreciation provisions in the federal tax code in 2008 through 2011 to defer significant taxes to later years. *See* NS 2008 SEC Form 10-K at K30 ("The improvement in 2008 (liquidity) resulted from increased railway operating income and from bonus depreciation which reduced current tax payments.".) NS also took further advantage of bonus depreciation in its 2009, 2010 and 2011 tax calculations. See NS 2009 SEC Form 10-K at K29, NS 2010 SEC Form 10-K at K28 and NS 2011 SEC Form 10-K at page K27.

[9] For example, a $1 million asset with a five (5) year MACRS life would accrue $500,000 in bonus depreciation in year 1 ($1 million x 50 percent bonus factor), plus $100,000 in standard MACRS depreciation ($500,000 remaining cost basis x 20% Year 1 MACRS factor for a 5 year asset) for a total of $600,000 in first year depreciation. See http://www.depreciationbonus.org/ for a description and example of bonus depreciation under the Stimulus Act and ARRA.

depreciation.[10] Table G of Exhibit III-H-1 displays the amount of bonus depreciation available to the DRR in 2009.

The STB expressed some skepticism in *AEPCO* as to whether bonus depreciation allowed under the prior and current tax law should be allowed in SAC presentations. Not allowing a shipper to avail itself of the bonus depreciation provisions clearly taken and used by the railroad companies, however, would create a clear barrier to entry, and place the shipper at a distinct disadvantage relative to the incumbent railroad. The STB defines a barrier to entry as any type of cost that a new entrant would have to incur that was not actually incurred by the defendant carrier.[11] There is no denying that the NS reduced its tax costs by employing the tax shielding effects of the bonus depreciation. If the STB were to disallow shippers the same tax advantage enjoyed by the incumbent railroad, it would be creating a barrier to entry by forcing the SARR to pay higher taxes than those paid by the incumbent. In this instance, the incumbent carrier, the NS, was able to lower its tax expense and increase its cash flow by employing the bonus depreciation allowed under the law. Denying the DRR the same tax- shielding benefits as the NS would be a textbook example of a barrier to entry to the SARR.

The STB may also have been concerned about the bonus depreciation since it deemed the bonus depreciation as "temporary," and "now-expired."[12] However, the bonus depreciation allowances allowed by federal tax law have extended over at least five (5) tax years, with the clear possibility of further extensions. In other words, bonus depreciation is still current under federal tax law.[13] Moreover, the structure of the Board's DCF model limits the bonus

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[10] The DRR begins calculating depreciation on all assets in the first year of railroad operations. This is consistent with the fact that no depreciation charges are incurred during the 24-month construction and testing period.

[11] *See West Texas Utilities* at 670.

[12] *See AEPCO* at 142.

[13] Not only is the bonus depreciation still applicable under current tax law, it was expanded in 2010 to allow 100 percent bonus depreciation for capital investments placed in service after September 8, 2010 through December 31, 2011. For equipment placed in service after December 31, 2011 and through December 31, 2012, the bill

depreciation taken by DuPont to only the assets placed into service in 2008 and 2009. This is because the DCF model assumes assets are only replaced at the end of their useful lives, meaning replacement assets are ineligible for use of the bonus depreciation. While not yet a permanent part of the federal tax code, the bonus depreciation is a tax benefit available to the DRR under applicable tax laws. DuPont, and other shippers, should not be penalized by incurring a cost that the incumbent carrier has not incurred.

g. Average Annual Inflation in Asset Prices

Table H computes the average annual inflation rate by which the capital recovery charge in Table I is indexed. The weighted average inflation rate was used because Table H calculates the required capital recovery necessary to return the investment. All road property and equipment accounts are indexed at the quarterly rates shown in Table B. The weighted average inflation rates are based on the inflation indexes discussed in Part III-G.

h. Discounted Cash Flow

Table I shows the calculation of the capital carrying charge and associated flow of funds required to recover the total road property investment and equipment investment. Inputs to this spreadsheet were taken from the Tables described *supra.* Table I calculates the quarterly capital carrying charge required over the 40 quarters of the DCF period, after consideration of the applicable tax liability.

The total start-up investment is comprised of the road property and equipment investment shown in Table C, the road property IDC calculated in Table D and the present value of replacement investment calculated in Table F, and any capitalized maintenance of way expenses. The result equals the total investment to be recovered over the life of the DRR from the quarterly capital recovery stream. The quarterly capital recovery stream reflects the tax benefits associated

provides for 50 percent depreciation bonus. In other words, the NS is currently enjoying the 100 percent bonus depreciation available to real world companies.

with interest on the investment financed with debt from Table E and the asset tax depreciation from Table G.

The cash flow shown in Column (8) of Table I is the amount remaining each quarter after the payment of federal and state tax liabilities. This cash flow is used for payment of return on total investment in the DRR. For road property investment, this quarterly figure is then discounted by the fourth root of the composite annual cost of capital from Table A, adjusted to reflect the assets being placed in service on June 1, 2009. The present value cash flow is then summed for each quarter along with the future cash flow; the total equals the total cost that must be recovered. The future cash flow is the residual value of the DRR's unconsumed assets, future interest payments and remaining tax liabilities (remaining interest and depreciation), and serves to reflect the cash flow required to account for the value of the assets not consumed during the 10-year life of the DCF model. Prior to the STB's decision in *AEPCO*, unused depreciation was accounted for in the terminal value calculation on an undiscounted basis. However, the STB modified its approach in *AEPCO* to calculate the present value of unused depreciation in the terminal value calculation.[14]

DuPont has included the STB's modified terminal value approach in its DCF model, but in doing so, has identified an additional flaw in the STB's model. The STB's DCF model explicitly assumes that the SARR's capital structure will remain constant into perpetuity.[15] This means that the amounts of common equity and debt carried on the assumed SARR's financial statements will remain the same forever. However, the STB's DCF model assumes that after year 20, and until the first assets are replaced in the replacement level of the DCF model, the

[14] *See AEPCO* at 140 to 141.

[15] The cost of capital used to calculate the terminal value in the DCF model equals the simple average cost of capital from the first year of the SARR's construction to the most recent cost of capital issued by the STB. It also reflects the average railroad industry capital structure over the same period. Between 2006 and 2010, debt as a percentage of railroad industry capital ranged from 20.7 to 29.1 percent.

railroad has no debt and no tax shielding interest payments. Stated differently, the model assumes, from a tax payment perspective, that the railroad is 100 percent equity financed after year 20 and before its first replacement cycle. This creates an irreconcilable mismatch between the SARR's cost of capital and its cash flows. The cost of capital assumes that the SARR is carrying debt, and its associated interest payments, but the cash flows reflect no benefits from the interest tax shields.

To correct for this flaw, DuPont adjusted the terminal value in the capital carrying charges to reflect the cost of capital assumption that the SARR's level of debt is held constant into perpetuity, and that interest tax shields consistent with this level of debt are accounted for in the cash flow calculation. Specifically, DuPont calculated an interest tax shield perpetuity by dividing the last full quarterly coupon payment by one plus the quarterly real cost of capital.[16] This calculation aligns the cost of capital assumption of a fixed level of debt forever, with the interest payable on this debt.[17]

This change not only corrects for a flaw in the STB's DCF model, but also aligns the SARR with how the real world railroads operate. As indicated above, the railroads are constantly issuing new debt as older debt issuances mature, or the railroads call the debt before its maturity. Since the last round of mergers in the mid-1990's the amount of railroad industry debt as measured by the four major railroads included in the STB's cost of capital calculations (UP, BNSF, CSXT and NS) has remained fairly consistent over time. As shown in Exhibit III-H-2, the amount of railroad industry debt between 1998 and 2009 has remained at around $30 billion in aggregate.[18] It is generally agreed in the financial community that borrowing can add

[16] This is the same type of calculation used to develop the terminal capital carrying charge.

[17] As to not double count the impact of the interest tax shields, DuPont has adjusted the asset replacement calculations to remove the impact of the interest tax shields on replacement assets.

[18] The amount of debt carried by the railroads increased beginning in 1996 as the railroads took on debt to finance their last round of mergers.

value to a firm because of the tax shielding impact of interest payments.[19] Under the STB's current DCF model assumptions, the value this debt adds from the interest tax shields is unaccounted for in all periods in the cash flow projections, but is accounted for in the cost of capital. The change made by DuPont corrects this flaw.

The development of the quarterly levelized capital carrying charge requirement is a relatively simple calculation, *i.e.,* starting capital carrying charge requirement times the quarterly index factor from Table H, which will recover total investment during the 10-year DCF model period. The starting capital carrying charge requirement which recovers the total investment is developed through an iterative process. The DCF model begins with a specified amount and then runs through the calculation described above to develop the cumulative present value of the cash flow. If this cumulative number does not equal the total costs to be recovered from the quarterly revenue flow (start-up investment plus the present value of the replacement investment), the starting cost is adjusted upward or downward as necessary and the DCF model runs through the calculations again. The process is repeated until the starting quarterly charge yields a cumulative present value cash flow which equals the required investment to be recovered from the quarterly capital recovery flow.

i. <u>Computation of Tax Liability -- Taxable Income</u>

Table J, Part 1 of Exhibit III-H-1 displays the calculation of the DRR's federal tax liability on road property. The procedures followed to develop the federal tax liability are discussed in Part III-G. Table J, Part 2 shows the calculation of the DRR's state income tax liability for both asset groups, which also is discussed in Part III-G.

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[19] See, for example, Brealey, R. A., Myers, S. C., and Allen, F., "Principles of Corporate Finance, Eighth Edition," McGraw-Hill Irwin, 2006, at page 476 ("Brealey, Myers and Allen"), "... most financial managers believe that there is a moderate tax advantage to corporate borrowing, at least for companies that are reasonably sure they can use the corporate tax shields."

j. Operating Expenses

Table K displays the operating expenses incurred in each year of the DCF period based on the traffic levels described in Part III-A. Annual operating expenses that change with the level of traffic volumes are adjusted by the annual change in ton-miles to take into consideration the shifting nature of DRR's traffic.[20] In this case, DuPont has adjusted train and engine personnel expenses, locomotive related expenses, loss and damage expenses, trackage rights fees, and intermodal lift costs annually by the change in DRR net ton-miles. Table K states the annual operating costs on a quarterly basis, and indexes them to reflect inflation over the 10-year analysis period based on the inflation rates shown in Table B.

k. Summary of SAC

Total SAC for the DRR based on investment and operating costs is summarized in Table L of Exhibit III-H-1. The capital requirement from Table I and the annual operating expenses from Table K are presented and summed in Table L for each year of the DRR's operation.

2. Maximum Rate Calculations

The SAC analysis summarized in Parts III-A through III-G and the accompanying Exhibits, and displayed in Exhibit III-H-1 demonstrates that over the 10-year DCF period the revenues generated by the DRR exceed its total capital and operating costs. Table III-H-1 below shows the measure of excess revenue over SAC in each year of the DCF period for this case.

[20] For example, assume that in Year 1 of the 10-year period Movement A transports 1,000 tons of product over 1,000 miles of the SARR, producing 1 million net ton-miles of traffic. In Year 2, Movement A is forecasted to be discontinued, but is replaced in the SARR traffic group by Movement B. Movement B also transports 1,000 tons of product, but only moves over 100 miles of the SARR, producing 100,000 net ton-miles. Movement B will be less expensive to move than Movement A, given the lower aggregate costs associated with a shorter movement and the 90 percent reduction in net ton-miles. Adjusting costs by the change in ton-miles instead of the change in tons reflects the shifting nature of the SARR's traffic mix and its actual impact on the SARR's operating costs.

Table III-H-1
Summary of DCF Results – June 2009 to May 2019
($ in millions)

Year (1)	Annual Stand-Alone Requirement (2)	Stand-Alone Revenues (3)	Overpayments or Shortfalls (4)	PV Difference (5)	Cumulative PV Difference (6)
1. 6/09 – 12/09	$2,422.6	$3,350.0	$927.4	$904.7	$904.7
2. 2010	4,722.5	6,642.8	1,920.4	1,675.9	2,580.6
3. 2011	5,153.7	7,250.9	2,097.2	1,654.9	4,235.5
4. 2012	5,424.8	8,092.6	2,667.7	1,894.7	6,130.2
5. 2013	5,765.3	8,683.1	2,917.8	1,865.2	7,995.4
6. 2014	5,989.1	9,511.5	3,522.4	2,026.7	10,022.1
7. 2015	6,231.6	10,287.5	4,055.8	2,100.4	12,122.5
8. 2016	6,550.7	11,264.7	4,714.1	2,197.4	14,319.9
9. 2017	6,863.7	12,407.6	5,543.9	2,325.9	16,645.8
10. 2018	7,197.0	13,496.9	6,299.9	2,379.0	19,024.9
11. 1/19 – 5/19	3,139.8	6,117.0	2,977.2	1,066.6	20,091.5

Source: Exhibit III-H-1

Where stand-alone revenues are shown to exceed costs, rates for the members of the DRR traffic group -- including DuPont in particular -- must be adjusted to bring revenues and SAC into equilibrium. In *Major Issues*, the Board adopted MMM as its rate prescription approach for use in proceedings under the *Coal Rate Guidelines*.[21]

Under MMM, maximum reasonable rates for each year of the DCF period are expressed as a ratio of each movement's stand-alone revenues to the variable cost of providing the subject service over the DRR route. Revenues are expressed as each movement's annual stand-alone revenue calculated using the ATC methodology detailed in Part III-A-3. Revenues are categorized based on traffic type (*i.e.*, coal, intermodal or general freight), NS origin and destination, and DRR origin and destination. Variable costs for each movement are calculated using NS's 2010 URCS costs for the portion of the movement replicated by the DRR, based on the nine (9) cost inputs identified in *Major Issues*.

[21] *See Major Issues* at 14-23.

The Board has determined that in calculating variable costs to implement a R/VC ratio rate standard, the Board's standard URCS indexing approach produces the most accurate results.[22] DuPont is relying on this determination, and uses the Board's URCS indexing procedure to forecast variable costs for the MMM calculation.

The STB's URCS index uses five (5) indexes: the AAR's Wage, Wage Supplements, Materials and Supplies and Fuel Indices, and the Producer Price Index – All Commodities ("PPI"), which are weighted by actual railroad costs reported in Annual Report Form R-1. Global Insight publishes forecasts for each of the first four (4) indices, and the Board already accepts Global Insight's forecasts of the first three (3) for use in the DCF model. The fuel forecast is included in the same documentation. Likewise, EIA -- whose coal production, transportation cost and GDP-IPD forecasts already are accepted by the Board -- publishes a PPI forecast.[23] To forecast NS URCS Phase III variable costs for MMM purposes, therefore, DuPont uses the STB's URCS index, with the March 2012 Global Insight and most recent EIA forecasts for its components. Weighting factors are taken from NS's Annual Report Form R-1 data.

Following the calculation of the specific annual variable costs for each movement, DuPont calculated each movement's maximum contribution toward SAC each year, expressed as a mark-up over the movement's variable costs. Under MMM, a movement cannot contribute more to SAC than the contribution reflected in the mark-up of its current, actual or forecasted rate over variable cost. For each year in the DCF period, the MMM model sets each movement's R/VC ratio at the lesser of the average R/VC ratio required to cover total SAC, or the movement's actual R/VC ratio. The average R/VC ratio required to cover SAC then is iteratively increased until no movement in the traffic group is assigned a share of SAC greater than its

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[22] *See OG&E* at 11.

[23] The EIA lists its PPI forecasts as its Wholesale Price Index forecasts in its Annual Energy Outlook.

actual contribution over variable costs as measured by its R/VC ratio, and the aggregate adjusted stand-alone revenues equal total SAC.[24]

Application of MMM yields the maximum R/VC ratios for each year of the DCF model summarized in Table III-H-2 below.

Table III-H-2
MMM Results

	Year (1)	Maximum R/VC (2)
1.	6/09 – 12/09	119.6%
2.	2010	119.9%
3.	2011	119.2%
4.	2012	115.7%
5.	2013	114.7%
6.	2014	111.1%
7.	2015	109.0%
8.	2016	105.4%
9.	2017	102.2%
10.	2018	99.4%
11.	1/19 – 5/19	96.6%

Source: Exhibit III-H-3.

As indicated in Table III-H-2, the maximum R/VC ranges from 96.6 percent to 119.9 percent over the 10-year DCF period.[25]

The maximum lawful transportation rates for DuPont traffic equal the greater of the jurisdictional threshold or the MMM maximum rates. Exhibit III-H-4 through Exhibit III-H-15 compare NS's rates at 2Q09 through 1Q12, respectively to the jurisdictional threshold and the MMM maximum rates. The issue NS rates are greater than both the jurisdictional threshold and the MMM rates for all movements and all time periods.

[24] According to the Board, this step reflects the assumption that the rates charged by NS on all non-issue traffic are profit-maximizing rates, such that the reapportionment represents "an appropriate application of demand-based differential pricing." *See Major Issues* at 14.

[25] Because of the large number of annual movements on the DRR (more than 6.1 million), the STB's standard MMM model, which uses an Excel spreadsheet, could not be used. Instead, DuPont developed an MMM model using Microsoft Access, which is better suited to handling large data sets. See DuPont Opening e-workpaper "MaximumMarkup.accdb."

Part IV

PART IV

WITNESS QUALIFICATIONS AND VERIFICATIONS

This Part contains the Statements of Qualifications of the witnesses who are responsible for the Narrative portions of DuPont's Opening Evidence (and the exhibits and workpapers referred to therein) identified with respect to each witness.

1. DUPONT WITNESSES

Travis Bond
Global Supply Chain Manager
E.I. du Pont de Nemours and Company

Travis Bond is cosponsoring factual evidence pertaining to Polyethylene (the "Commodity"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Bond is qualified and competent to provide testimony in this proceeding. Since May 2011, Mr. Bond has held the position of Global Supply Chain Manager. In this position, Mr. Bond's responsibilities include: (1) ensuring raw material supply is available for manufacturing facilities; (2) ensuring the Commodity is available for customer orders; (3) maintaining inventory of the Commodity at a level that is aligned with business strategy; (4) delivering the Commodity to customers; and (5) managing the Commodity's distribution costs. Prior to serving as a Global Supply Chain Manager, Mr. Bond held Regional Supply Chain Manager positions in both North America and Europe.

Mr. Bond holds the degree of Bachelor of Science in Chemical Engineering from Texas A&M University. In addition, he holds a Master of Business Administration from University of Florida. Mr. Bond is an APICS, The Association for Operations Management, Certified Supply Chain Professional.

VERIFICATION

I, Travis Bond, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Travis Bond
Global Supply Chain Manager

Executed on 12 Apr 2012

Michael Faciszewski
Contract Manufacturing Manager
E.I. du Pont de Nemours and Company

Michael Faciszewski is cosponsoring factual evidence pertaining to Lime (the "Commodity"). The sponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Faciszewski is qualified and competent to provide testimony in this proceeding. He has been a DuPont employee since 1999, and since July 1, 2008, Mr. Faciszewski has held the position of Contract Manufacturing Manager. In this position, Mr. Faciszewski's responsibilities include: benchmarking and optimizing the capability and performance of contracted resources, including Lime production; protecting DuPont manufacturing know-how from transfer to third parties; determining the business requirements for contract manufacturing, including Lime production; and ongoing contract administration of various contracts, including the DanChem Lime contract, to ensure contractor compliance. Prior to being in this role, Mr. Faciszewski held positions in Research and Development, Process Engineering, Quality Engineering, and Six Sigma.

Mr. Faciszewski holds Bachelor of Science degree in Chemical Engineering from the State University of New York at Buffalo.

VERIFICATION

I, Michael Faciszewski, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Michael Faciszewski
Contract Manufacturing Manager

Executed on 16 - April - 2012

Jeff Jirak
Global Business Manager Methylamines
E.I. du Pont de Nemours and Company

Jeff Jirak is cosponsoring factual evidence pertaining to Anhydrous Methylamines, Aqueous Methylamines, Dimethyl Formamide, Dimethyl Sulfate, and Monomethyl Formamide (the "Commodities").[1] The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodities.
- The characteristics of the Commodities.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodities.
- DuPont and its customers and suppliers' ability to handle the Commodities.
- Information concerning the market for the Commodities.
- Production and supply considerations regarding the Commodities.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Jirak is qualified and competent to provide testimony in this proceeding. Since January 2011, Mr. Jirak has held the position of Global Business Manager Methylamines. In this position, Mr. Jirak's responsibilities include: business strategy development, market and competitive assessments, product line management, and overall profitability of the Methylamines business. Mr. Jirak has worked for DuPont for 20 years and has held positions in engineering, operations, supply chain, sales/marketing, and business management.

[1] The cosponsored anhydrous methylamines evidence includes anhydrous mono-, di-, and tri-methylamines. The cosponsored aqueous methylamines evidence includes aqueous mono- and di-methlamines.

Mr. Jirak holds a Bachelor of Science degree in Mechanical Engineering from Michigan State University. In addition, he holds a Master's degree in Business Administration from Drexel University.

VERIFICATION

I, Jeff Jirak, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Jeff Jirak
Global Business Manager Methylamines

Executed on 4-12-2012

James Kanicky
Ore Products Business Manager
E.I. du Pont de Nemours and Company

James Kanicky is cosponsoring factual evidence pertaining to Sand Zircon and Titanium Tetrachloride (the "Commodities"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodities.
- The characteristics of the Commodities.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodities.
- DuPont and its customers and suppliers' ability to handle the Commodities.
- Information concerning the market for the Commodities.
- Production and supply considerations regarding the Commodities.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Kanicky is qualified and competent to provide testimony in this proceeding. Since November 2011, Mr. Kanicky has held the position of Ore Products Business Manager in the DuPont Titanium Technologies business. In this position, Mr. Kanicky's responsibilities include accountability for product stewardship and business performance metrics of the Commodities. Mr. Kanicky has also held multiple other positions in the DuPont Titanium Technologies business since 2002, including Research and Development Engineer and Technology Manager positions.

Mr. Kanicky has a Ph.D. in Chemical Engineering and has a combined ten years' experience as an engineering professional and manager.

VERIFICATION

I, James Kanicky, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

James Kanicky
Ore Products Business Manager

Executed on April 16, 2012

Paul Kostrzewski
Senior Buyer—Petroleum Coke
E.I. du Pont de Nemours and Company

Paul Kostrzewski is cosponsoring factual evidence pertaining to Petroleum Coke (the "Commodity"). The sponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Kostrzewski is qualified and competent to provide testimony in this proceeding. Since May 2009, Mr. Kostrzewski has held the position of Senior Buyer—Petroleum Coke. In this position, Mr. Kostrzewski's responsibilities include: negotiation, preparation and execution of procurement agreements across five world-scale titanium dioxide production plants; and responsibility for $100 million of specialty chemical and commodity raw materials, including the Commodity. Mr. Kostrzewski is a certified black belt in six sigma.

Mr. Kostrzewski holds the degree of Bachelor of Science in Chemical Engineering from Lehigh University. In addition, Mr. Kostrzewski holds a Master of Business Administration degree from New York University.

VERIFICATION

I, Paul Kostrzewski, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Paul Kostrzewski
Senior Buyer—Petroleum Coke

Executed on 4/16/12

Brad Kulesza
Operations Business Leader
E.I. du Pont de Nemours and Company

Brad Kulesza is cosponsoring factual evidence pertaining to Hydrochloric Acid (the "Commodity"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Kulesza is qualified and competent to provide testimony in this proceeding. Since April 2011, Mr. Kulesza has held the position of Operations Business Leader for multiple product lines, including the F22 produced at DuPont's Louisville facility. Hydrochloric acid is a co-product of F22 production. In this position, Mr. Kulesza's responsibilities include: developing overall supply chain strategy for the Commodity; asset management; driving key improvement programs; and insuring overall supply meets the business needs. Prior to his current position, Mr. Kulesza has supported other product lines as Asset Manager and has served as Hydrochloric Acid Product and Business Manager between 2000 and 2005.

Mr. Kulesza holds a Bachelor of Science degree in Chemical Engineering from the University of Akron.

VERIFICATION

I, Brad Kulesza, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Brad E Kulesza

Brad Kulesza
Operations Business Leader

Executed on 4/25/2012

John Leuszler
U.S. Account Manager
E.I. du Pont de Nemours and Company

John Leuszler is cosponsoring factual evidence pertaining to Difluoroethane and Dimethyl Ether (the "Commodities"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodities.
- The characteristics of the Commodities.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodities.
- DuPont and its customers and suppliers' ability to handle the Commodities.
- Information concerning the market for the Commodities.
- Production and supply considerations regarding the Commodities.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Leuszler is qualified and competent to provide testimony in this proceeding. Since November 1981, Mr. Leuszler has held the position of U.S. Account Manager. In this position, Mr. Leuszler's responsibilities include: attaining sales and profitability for the propellants business by maintaining customer relationships and reviewing customer pricing and the costs of delivering Difluoroethane and Dimethyl Ether to them; coordinating with others to ensure adequate supply and prompt delivery of these chemicals. Prior to his current position, Mr. Leuszler supervised maintenance in the bulk storage area of DuPont's Corpus Christi plant.

Mr. Leuszler holds a Bachelor of Science degree in Mechanical Engineering from Cornell University.

VERIFICATION

I, John Leuszler, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

John Leuszler
U.S. Account Manager

Executed on 9/13/2012

Mark McLendon
Master Scheduler
E.I. du Pont de Nemours and Company

Mark McLendon is cosponsoring factual evidence pertaining to Waste Flammable Liquid (the "Commodity"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. McLendon is qualified and competent to provide testimony in this proceeding. Mr. McLendon has worked at the DuPont Mobile site since 1978 in various roles involving site operation, environmental management, and distribution safety. Since January 2012, Mr. McLendon has been the Supply Chain Manager / Master Scheduler for DuPont's Mobile operations. In this role, Mr. McLendon is responsible for the alignment of the production scheduling at the Mobile site, including the scheduling of the Commodity. From 2001 through 2011, Mr. McLendon served as the Distribution Team Leader at DuPont's Mobile facility. In this position, Mr. McLendon's responsibilities included: identifying and authorizing shipping routes; specifying U.S. Department of Transportation ("DOT") approved containers; and serving as the site resource on the DOT's hazardous materials regulations. While in this position, he also supported the Gulf Coast region of North America as a distribution resource from 2007 to 2010, providing DOT regulatory guidance, training, and support in the handling and movement of DOT regulated hazardous materials.

VERIFICATION

I, Mark McLendon, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Mark McLendon
Mark McLendon
Supply Chain Manager / Master Scheduler

Executed on 4/18/12

Gloria L. Taylor
Commission Expires 8/19/2013

Nicky Mills
Kinston Supply Chain Manager
E.I. du Pont de Nemours and Company

Nicky Mills is cosponsoring with Pamela Wilson factual evidence pertaining to Propanediol Bio (the "Commodity"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Mills is qualified and competent to provide testimony in this proceeding. Since August 2001, Mr. Mills has held the position of Kinston Supply Chain Manager. In this position, Mr. Mills's responsibilities include: supervising daily operations in shipping warehouses, the chemical tank farm, terephthalic acid powder unloading silos, and finished product loading silos; and managing and procuring all raw material inventory used on site

Mr. Mills hold a Bachelor of Science degree in Industrial Technology.

VERIFICATION

I, Nicky Mills, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Nicky Mills
Nicky Mills
Kinston Supply Chain Manager

Executed on 4-16-2012

Edward L. Morris, Jr.
Operations Business Leader—Sulfur Products
E.I. du Pont de Nemours and Company

Edward L. Morris, Jr., is cosponsoring factual evidence pertaining to Fuming Sulfuric, Sulfuric Acid, Spent Sulfuric Acid, and Sulfur Trioxide (the "Commodities"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodities.
- The characteristics of the Commodities.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodities.
- DuPont and its customers and suppliers' ability to handle the Commodities.
- Information concerning the market for the Commodities.
- Production and supply considerations regarding the Commodities.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Morris is qualified and competent to provide testimony in this proceeding. Mr. Morris joined DuPont in June 1980. Since April 2011, Mr. Morris has held the position of Operations Business Leader—Sulfur Products. In this position, Mr. Morris's responsibilities include monitoring and managing supply chain performance and developing strategic supply chain plans for the sulfur products business.

Mr. Morris holds the degree of Bachelor of Science in Mechanical Engineering from Clarkson University and has also completed the APICS, The Association for Operations Management, Certified in Production and Inventory Management program.

VERIFICATION

I, Edward L. Morris, Jr., verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Edward L. Morris, Jr.
Operations Business Leader—Sulfur Products

Executed on 4/16/2012

Leslie Muir
North America Logistics Planner—DuPont Titanium Technologies
E.I. du Pont de Nemours and Company

Leslie Muir is cosponsoring factual evidence pertaining to Titanium Dioxide (the "Commodity"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Ms. Muir is qualified and competent to provide testimony in this proceeding. Since June 2009, Ms. Muir has held the position of North America Logistics Planner—DuPont Titanium Technologies. In this position, Ms. Muir's responsibilities include ensuring the safe, timely, and cost effective distribution of Titanium Dioxide, Titanium Tetrachloride, and co-products to customers in North America and Mexico. Ms Muir is an APICS, The Association for Operations Management, Certified Supply Chain Professional. In addition, Ms Muir holds Six Sigma Green Belt and Black Belt certifications as well as the designation of Certified Process Master from Hammer and Company, the worldwide leader for process design, redesign, and education.

Ms. Muir holds a Bachelor of Arts degree in International Relations from the Pennsylvania State University.

VERIFICATION

I, Leslie Muir, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Leslie A. Muir

Leslie Muir
North America Logistics Planner—DuPont Titanium Technologies

Executed on 4-12-2012

Matthew Nowicki
Supply Chain Manager
E.I. du Pont de Nemours and Company

Matthew Nowicki is sponsoring factual evidence pertaining to Glycolic Acid (the "Commodity"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Nowicki is qualified and competent to provide testimony in this proceeding. Since May 2005, Mr. Nowicki has held the position of Supply Chain Manager. In this position, Mr. Nowicki's responsibilities include: overall coordination of forecasted global demand versus planned plant production; variable cost monitoring; and adherence to supply chain management best practices. Moreover, Mr. Nowicki is a certified Six Sigma Black Belt and Master Black Belt. He is also an APICS, The Association for Operations Management, Certified Supply Chain Professional.

Mr. Nowicki graduated from Tufts University with Bachelor of Science and Master of Science degrees in Electrical Engineering.

VERIFICATION

I, Matthew Nowicki, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Matthew Nowicki
Supply Chain Manager

Executed on 4-16-11

Mary L. Pileggi
Logistics Manager-North America Region
E.I. du Pont de Nemours and Company

Ms. Pileggi is cosponsoring factual evidence pertaining to the transportation and logistics of all commodities listed in the complaint. The sponsored evidence includes, but is not limited to:

- The identity of transportation providers engaged by E.I. du Pont de Nemours and Company ("DuPont") to transport the commodities.
- The contracts and agreements between DuPont and those transportation providers.
- DuPont's use and ability to use various modes of transportation to transport the commodities.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them; and
- Transportation costs that are or would be incurred by DuPont under various scenarios.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Ms. Pileggi is qualified and competent to provide testimony in this proceeding. She joined DuPont in December 1999. Since March 2003, Ms. Pileggi has held the position of Logistics Manager-North America Region. In this position, her responsibilities include: logistic operations, transportation equipment, and supervision of the procurement and administration of agreements between DuPont and its carriers. Prior to joining DuPont, Ms. Pileggi worked for Conrail for 19 years with her last position as Director Marketing-Petrochemicals, Minerals and Waste. Ms. Pileggi has also served on the Board of Directors for the Indiana Harbor Belt Railroad (IHB).

Ms. Pileggi is a Certified Supply Chain Professional (CSCP) as a member of APICS, The Association for Operations Management. She currently represents DuPont on the Distribution Committee for the American Chemistry Council. She also serves on the Board of Directors for National Freight Transportation Association (NFTA) and on the Executive Committee for the National Industrial Transportation League (NITL) as Third Vice Chairman.

Ms. Pileggi holds the degree of Bachelor of Science in Mathematics from St. Joseph's University. In addition, Ms. Pileggi holds an Executive MBA from Drexel University.

VERIFICATION

I, Mary L. Pileggi, verify under penalty of perjury that I have read the Opening Evidence of E.I. du Pont de Nemours and Company in this proceeding that I have cosponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Mary L. Pileggi
Mary L. Pileggi
Logistics Manager-North America Region

Executed on 3/30/12

Suneet Ranganath
Sourcing Manager—Ag & Nutrition
E.I. du Pont de Nemours and Company

Suneet Ranganath is sponsoring factual evidence pertaining to Chlorine, Potassium Caustic, and Sodium Caustic (the "Commodities"). The sponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodities.
- The characteristics of the Commodities.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodities.
- DuPont and its customers and suppliers' ability to handle the Commodities.
- Information concerning the market for the Commodities.
- Production and supply considerations regarding the Commodities.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Ranganath is qualified and competent to provide testimony in this proceeding. Since November 2011, Mr. Ranganath has held the position of Sourcing Manager—Ag & Nutrition. Prior to holding this position, Mr. Ranganath held the position of Executive Buyer – Chloralkali from June 2010 to October 2011. In the executive buyer position, Mr. Ranganath's responsibilities were to develop strategic plans and buys for chloralkali chemicals including chlorine, sodium caustic, and potassium hydroxide. His specific responsibilities included identifying and driving continuous improvement in the contractual relationships with suppliers focused on material procurement and delivery as well as developing forecasts used in strategic plans and price forecasts. Mr. Ranganath has 21 years of experience within DuPont, with approximately seven years in manufacturing and manufacturing management, seven years in marketing, and seven years in Sourcing.

Mr. Ranganath holds a Bachelors of Science degree in Chemical Engineering from the University of Cincinnati. In addition, he holds a Masters of Business Administration degree from the University of Delaware and a Juris Doctor degree from Widener University of Law.

VERIFICATION

I, Suneet Ranganath, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Suneet Ranganath
Sourcing Manager—Ag & Nutrition

Executed on 18-April-2012

Greg Rupert
Senior Process Engineer
E.I. du Pont de Nemours and Company

Greg Rupert is sponsoring factual evidence pertaining to Sodium Methylate (the "Commodity"). The sponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Mr. Rupert is qualified and competent to provide testimony in this proceeding. Since November 2004, Mr. Rupert has held the position of Senior Process Engineer. In this position, Mr. Rupert's responsibilities include: plant operational and design support to the Sodium Methylate unit at DuPont's LaPorte site; and consulting/startup/operational/design assistance to the DuPont Reactive Metals division in support of tolling operations of sodium methylate in North and South America. Prior to joining DuPont, Mr. Rupert spent fifteen years working in various operation and process design roles in the chemical process industries in North America and Europe.

Mr. Rupert holds a Bachelor of Science degree in Chemical Engineering from the University of Houston.

VERIFICATION

I, Greg Rupert, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Greg Rupert
Senior Process Engineer

Executed on 4/13/2012

Katie Snyder
Business Manager Aniline
E.I. du Pont de Nemours and Company

Katie Snyder is cosponsoring factual evidence pertaining to Oil Aniline (the "Commodity"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Ms. Snyder is qualified and competent to provide testimony in this proceeding. Since September 2009, Ms. Snyder has held the position of Business Manager Aniline. In this position, Ms. Snyder's responsibilities include: achievement of business earnings and cash objectives, compliance with standardized processes and regulatory requirements for the business, and sustainable improvement of all aspects of the business. In addition, Ms. Snyder was the Global Sourcing Manager for DuPont Chemical Solutions Enterprise from 2002-2003.

Ms. Snyder holds a Bachelor of Science degree in Chemical Engineering, with honors, from Oklahoma State University.

VERIFICATION

I, Katie Snyder, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am cosponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Katie Snyder
Katie Snyder
Business Manager Aniline

Executed on 4-16-12

<u>**Pamela J. Wilson**</u>
Global Supply Chain Planner
E.I. du Pont de Nemours and Company

Pamela J. Wilson is cosponsoring with Nicky Mills factual evidence pertaining to Propanediol Bio (the "Commodity"). The cosponsored evidence includes, but is not limited to:

- E.I. du Pont de Nemours and Company's ("DuPont's") use and ability to use various modes of transportation to transport the Commodity.
- The characteristics of the Commodity.
- The transportation needs and requirements of DuPont, its customers, and its suppliers, including any contractual requirements between them, for the Commodity.
- DuPont and its customers and suppliers' ability to handle the Commodity.
- Information concerning the market for the Commodity.
- Production and supply considerations regarding the Commodity.

These issues are discussed in Part I ("Counsel's Argument and Summary of Evidence") and Part II-B ("Qualitative Market Dominance").

Ms. Wilson is qualified and competent to provide testimony in this proceeding. Since February 2008, Ms. Wilson has held the position of Global Supply Chain Planner. In this position, Ms. Wilson's responsibilities include: leading and managing activities in the Commodity's supply chain; evaluating the competitiveness of the Commodity's supply chain with respect to service, cost, and investment; leading improvement activities in all aspects of the Commodity's supply chain to simplify the supply chain where possible; planning, controlling, and scheduling all activities supporting Propanediol Bio products; and overseeing the finished product master plans that look ahead 3-24 months and the planned requirements for the

PJW
4/17/12

associated raw materials, purchased parts, and packaging supplies. In addition, Ms. Wilson has 28 years of experience at DuPont in various technical, operations, and supply chain roles.

Ms. Wilson holds Bachelor of Science degrees in Metallurgical Engineering and Materials Science from Carnegie Mellon University. She also holds a Master's Degree in Business Administration from Wilmington College. Ms. Wilson has received a Certified in Production and Inventory Management certification from APICS, The Association for Operations Management.

RJR 4/17/12

VERIFICATION

I, Pamela J. Wilson, verify under penalty of perjury that I have read the portions of E.I. du Pont de Nemours and Company's Opening Evidence that I am sponsoring, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct based on my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this statement.

Pamela J. Wilson

Pamela J. Wilson
Global Supply Chain Planner

Executed on 4/17/12

2. RICHARD H. MCDONALD

Mr. McDonald is president of RHM Consulting, Inc., a transportation planning firm specializing in the railroad industry. RHM Consulting is located at 516 W. Shady Lane, Barrington, Illinois. Mr. McDonald's experience includes 42 years in varied and increasingly responsible positions with the New York Central ("NYC"), Penn-Central ("PC"), and Chicago and Northwestern ("CNW") Railroads. The specific evidence Mr. McDonald developed and is sponsoring is DuPont's evidence as it relates to the stand-alone railroad ("SARR") operating plan (Part III-C), the operating personnel and the General and Administrative personnel required to manage the DuPont SARR (Part III-D).

Mr. McDonald graduated from the University of Illinois, College of Engineering with a Bachelor of Science degree in Civil Engineering in 1957. He completed the following certificate programs: Railroad Engineering, University of Illinois, 1975; Management for Engineers, University of Iowa, 1976; Accounting for the Non-Accounting Executive, Wharton School, University of Pennsylvania, 1977; and Railroad Profit Strategy, Kellogg Center, Northwestern University, 1990. Mr. McDonald is a member of the American Railway Engineering Association and the Chicago Maintenance of Way Club. Mr. McDonald served on the Board of Directors of the Peoria & Pekin Union Railway and Minnesota Transfer Properties, Inc. from 1984 to 1994.

Mr. McDonald founded RHM Consulting in 1994 and since that time has successfully completed numerous assignments for railroads, shippers and public entities related to transportation issues, including; rail line construction projects, operational adjustments and analyses of railroad operations, such as restructuring the Ferrocarriles Nacionales de Mexico ("FNM") into an independent, modern terminal transportation company.

Prior to joining CNW, Mr. McDonald was an officer in the Operating Department on the NYC and PC railroads from 1960 to 1974. During this period, Mr. McDonald was assigned duties in Indianapolis, IN, Columbus, OH, Youngstown, OH and Rochester, NY.

Mr. McDonald's career with CNW included a number of high-level positions over a period of twenty years. These positions included: Vice President–Planning & Acquisitions, Vice President–Operations, Vice President–Engineering, Vice President–Transportation, Vice President–Operating Administration, Vice President–Western Railroad Properties, Inc., Assistant Vice President–Transportation, Assistant to Vice President & Division Manager–Transportation and Assistant to Vice President-Transportation. As Vice President–Western Rail Properties, Inc. ("WRPI"), Mr. McDonald was responsible for the successful planning, construction and operation of the CNW/WRPI rail line into the Powder River Basin ("PRB"). As Vice-President Operations, he was responsible for Transportation, Engineering and Mechanical departments and related functions for both freight and commuter service on the CNW, which incidentally, was similar in size and complexity to the DuPont Railroad. Mr. McDonald has testified before the Surface Transportation Board in numerous stand-alone cost proceedings, including STB Docket No. 42051, *Wisconsin Power & Light Company v. Union Pacific Railroad Company*, STB Docket No. 42054, *PPL Montana, LLC v. The Burlington Northern and Santa Fe Railway Company,* STB Docket No. 42051, *Public Service Company of Colorado d/b/a Xcel Energy v. The Burlington Northern and Santa Fe Railroad Company.*

VERIFICATION

I, Richard H. McDonald, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Richard H. McDonald

Executed on April 27, 2012

3. **HARVEY A. CROUCH, P.E.**

Mr. Crouch is President and CEO of Crouch Engineering, P.C. His business address is 428 Wilson Pike Circle, Brentwood, TN 37027. Crouch Engineering is a consulting firm providing high quality railway engineering and planning services to railroads, governmental agencies and private industry.

The specific portions of DuPont's Opening Evidence that Mr. Crouch is sponsoring are (1) Part III-D-5 relating to the SARR maintenance-of-way-plan and annual expenses, and (2) the portion of Part III-F relating to the SARR's construction costs.

Mr. Crouch has served as a Track Supervisor and Project Engineer in the Maintenance of Way & Structures ("MW&S") Department of Norfolk Southern Railway ("NS"). He founded Crouch Engineering in 1991 and since that time has provided railway engineering services to numerous railroads and government agencies. He has been responsible for many track and bridge construction and rehabilitation projects across the United States, predominantly in the Eastern United States, in the Central and Southern Appalachian regions and elsewhere. His clients have included NS (for which he has designed over 30 capital projects), and over 120 short line and regional railroads, including many of the RailAmerica and Genesee and Wyoming railroads, East Tennessee Railway, Eastern Alabama Railway, South Central Tennessee Railroad, Knoxville & Holston River Railroad, KTW Railway, Nashville & Eastern Railroad, New England Central Railroad, Tennessee Southern Railroad, TennKenn Railroad, Toledo, Peoria and Western Railroad, and the Kyle Railroad among others. He has conducted hundreds of on-site evaluations of railroad facilities to identify needed repairs or improvements; conducted engineering surveys and prepared plans, specifications and cost estimates for railroad capital construction projects, repairs and improvements; provided construction management and inspection services, including preparation and analysis of bid documents; and evaluated many new railroad routes for proposed construction or proposed line changes. Mr. Crouch has also designed many railroad locomotive and car repair facilities, including shops on the Connecticut Southern Railroad, San Luis & Rio Grande Railroad, South Carolina Central Railroad, Tennessee Southern Railroad, Alabama Gulf Coast Railroad, Franklin Industries Railroad, KWT Railway, and Knoxville & Holston River Railroad.

From 1977 to 1987, Mr. Crouch worked for Southern Railway and NS (after the merger of the Southern and Norfolk & Western Railroads) in the MW&S Department. He started with Southern Railway as a Coop Engineer in 1977, and continued in that position through 1980. Mr. Crouch resumed service in 1982 with NS as a Management Trainee, and in 1983 was appointed Project Engineer in which position he was responsible for project management of railroad construction projects in Columbia, SC, and on NS's Appalachian Division which included mountainous areas in western Virginia and Tennessee. He was responsible for a variety of projects including construction of new connecting tracks, sidings, yards, lead tracks, and assisted on a tunnel bypass, conversions from dark territory to CTC, and other projects.

From 1986 to 1987, Mr. Crouch was a Track Supervisor and was responsible for the inspection and maintenance of the NS main line trackage from Danville to a point near Richmond, VA, including track inspection, day-to-day supervision of work gangs, safety program, ordering material, budgeting, planning, and construction management for rehabilitation and maintenance of track and bridges. Mr. Crouch was qualified by NS as an FRA-qualified track inspector, and continues to perform inspections based on FRA track safety standards.

From 1988 to 1991, Mr. Crouch worked as a Graduate Research Assistant for Tennessee Tech, as an Environmental Engineer for the Tennessee Valley Authority, and as Project Manager for McCoy Associates, Inc., an engineering firm involved in bridge inspection, design, planning and project management and new railroad facility design. He left McCoy Associates in 1991 to found Crouch Engineering. In addition to his U.S. consulting work, Mr. Crouch has worked on bridge evaluations in Canada, and on contractor requirements, bidding and negotiations for Freight Victoria's entire rail infrastructure (over 2,500 miles) in Australia. Mr. Crouch has also worked on a preliminary concept design of a 260-mile rail line in West Africa, including design for 286K for track and bridges, sidings, yards, and locomotive and car repair facilities.

Mr. Crouch received a Bachelor of Science in Civil Engineering from Tennessee Technological University in 1982 and a Master of Science in Civil Engineering from Tennessee Tech in 1989. Mr. Crouch is a registered Professional Engineer in more than 35 states. He is a member of the American Railway Engineering and Maintenance of Way Association (AREMA), the American Short Line and Regional Railroad Association, the American Society of Civil Engineers, and the National Society of Professional Engineers.

Mr. Crouch was assisted in preparing the SARR construction-cost evidence in Part III-F by various members of his firm, including in particular Richard Davis R.L.S., who was primarily responsible for identifying and laying out the DRR's routes.

VERIFICATION

I, Harvey A. Crouch, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Harvey A. Crouch

Executed on April 27, 2012

4. THOMAS D. CROWLEY

Mr. Crowley is an economist and President of L.E. Peabody & Associates, Inc., an economic consulting firm that specializes in solving economic, marketing, and transportation problems. The Firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, VA, 22314, 760 E. Pusch View Lane, Tucson, AZ 85737 and 21 Founders Way, Queensbury, NY 12804.

Mr. Crowley is sponsoring portions of DuPont's Opening Evidence in Parts II and III. Specifically, Mr. Crowley is co-sponsoring Part II-A with Witness Timothy D. Crowley, Part III-A with Witnesses Michael E. Lillis, Robert D. Mulholland and Sean Nolan, Part III-G with Witness Daniel L. Fapp and Part III-H with Witness Daniel L. Fapp.

Mr. Crowley is a graduate of the University of Maine from which he obtained a Bachelor of Science degree in Economics. He has also taken graduate courses in transportation at The George Washington University in Washington, D.C. He spent three years in the United States Army and has been employed by L.E. Peabody & Associates, Inc. since February, 1971. He is a member of the American Economic Association, the Transportation Research Forum, and the American Railway Engineering Association.

As an economic consultant, Mr. Crowley has organized and directed economic studies and prepared reports for railroads, freight forwarders and other carriers, shippers, associations, and state governments and other public bodies dealing with transportation and related economic and financial matters. Examples of studies in which he has participated include organizing and directing traffic, operational and cost analyses in connection with multiple car movements, unit train operations for coal and other commodities, freight forwarder facilities, TOFC/COFC rail facilities, divisions of through rail rates, operating commuter passenger service, and other studies dealing with markets and the transportation by different modes of various commodities from both eastern and western origins to various destinations in the United States. The nature of these studies has enabled Mr. Crowley to become familiar with the operating and accounting procedures utilized by railroads in the normal course of business.

Additionally, Mr. Crowley has inspected both railroad terminal and line-haul facilities used in handling general freight, intermodal and unit train movements of coal and other commodities in all portions of the United States. The determination of the traffic and operating characteristics for specific movements was based, in part, on these field trips.

In addition to utilizing the methodology for developing a maximum rail rate based on stand-alone costs, Mr. Crowley also presented testimony before the ICC in Ex Parte No. 347 (Sub-No. 1), *Coal Rate Guidelines - Nationwide*, the proceeding that established this methodology and before the STB in Ex Parte No. 657 (Sub-No. 1), *Major Issues In Rail Rate Cases*, the proceeding that modified the application of the stand-alone cost test. Mr. Crowley also presented testimony in a number of the annual proceedings at the STB to determine the railroad industry current cost of capital, i.e., STB Ex Parte No. 558, *Railroad Cost of Capital*. He has submitted evidence applying ICC (now the STB) stand-alone cost procedures in numerous rail rate cases. He has also developed and presented numerous calculations utilizing the various formulas employed by the ICC and STB (both Rail Form A and Uniform Railroad Costing System ("URCS")) to develop variable costs for rail common carriers. In this regard, Mr. Crowley was actively involved in the development of the URCS formula, and presented evidence to the ICC analyzing the formula in Ex Parte No. 431, *Adoption of the Uniform Railroad Costing System for Determining Variable Costs for the Purposes of Surcharge and Jurisdictional Threshold Calculations*.

As a result of his extensive economic consulting practice since 1971 and his participating in maximum-rate, rail merger, and rule-making proceedings before the ICC and the STB, Mr.

Crowley has become thoroughly familiar with the operations, practices and costs of the rail carriers that move traffic over the major rail routes in the United States.

VERIFICATION

I, Thomas D. Crowley, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Thomas D. Crowley

Executed on April 27, 2012

5. PHILIP H. BURRIS

Mr. Burris is Senior Vice President of L.E. Peabody & Associates, Inc., an economic consulting firm with offices in Alexandria, VA, Tucson, AZ and Queensbury, NY. The specific evidence Mr. Burris is sponsoring relates to the development of operating statistics based on the output of the RTC model and the operating plan (Part III-C), including the development of train crew personnel requirements (Part III-D), development of equipment lease, maintenance and servicing costs (Parts III-D-1 and III-D-2), operating unit costs (Parts III-D-3 and III-D-5 through III-D-9) and compensation levels for all the DRR transportation and operating (including engineering) employees, non-operating (General and Administrative) personnel, and training and recruiting costs (Parts III-D-2, III-D-3-d, and III-D-4). Mr. Burris is also sponsoring the non-road property investment (Part III-E) and the identification of land to be acquired through easements and the associated costs of that land (Part III-F-1).

Mr. Burris received his Bachelor of Science in Business Administration from Virginia Polytechnic Institute and State University in 1971. He was awarded a Masters in Business Administration, specializing in transportation economics, from American University in 1978. Mr. Burris has worked in the consulting industry for more than 30 years. In addition to his current position as Senior Vice President of L.E. Peabody & Associates, Inc., Mr. Burris has been an employee of the following consulting firms: A. T. Kearney, Wyer Dick & Associates, Inc. and George C. Shaffer & Associates.

Mr. Burris has extensive experience in the field of transportation economics as it pertains to transportation supply alternatives, plant location analysis, regulatory policy and dispute resolution before regulatory agencies as well as state and federal courts. He has designed, directed and executed analyses of the costs of moving various commodities by different modes of transportation including rail, barge, truck, pipeline and intermodal. He has also performed economic analyses of maximum reasonable rate levels for the movement of coal and other commodities using the Board's CMP methodology, and specifically the stand-alone cost constraint. Mr. Burris has submitted evidence regarding maximum reasonable rate levels using the stand-alone cost constraint to the Board and its predecessor and testified before the Railroad Commission of Texas, the Colorado Public Utilities Commission, the Illinois Commerce Commission, the Public Service Commission of Nevada and various state and federal courts and arbitration panels.

In the public sector, Mr. Burris has performed studies and written draft reports for the Railroad Accounting Principles Board, an independent body created by Congress to establish cost accounting principles for use in implementing the regulatory provisions of the Staggers Act of 1980.

Since 2005, Mr. Burris has served as a member of the Board of Directors of the South Central Florida Express Railroad, a wholly owned subsidiary of United States Sugar Corporation.

VERIFICATION

I, Philip H. Burris, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Philip H. Burris

Executed on April 27, 2012

6. CHARLES A. STEDMAN

Mr. Stedman is a Vice President of L. E. Peabody & Associates, Inc., headquartered in Alexandria, VA. The specific evidence Mr. Stedman is co-sponsoring relates to the roadbed preparation/earthworks component of the road property investment cost of the SARR, exclusive of culverts, roadbed specifications and yard drainage (Part III-F-2). Mr. Stedman is also sponsoring the development of SARR route miles (Part III-B-1-d).

Mr. Stedman has been employed by L. E. Peabody & Associates, Inc. since October 1981. Since that time, he has performed and directed numerous extensive projects and analyses undertaken on behalf of utility companies, short line railroads, state and local governments and entrepreneurs. These projects include: (a) participation in the development of variable cost evidence presented to the ICC and the Board in numerous cases; (b) the development of variable costs contained in numerous reports and other analyses presented to clients; (c) the development of stand-alone cost evidence presented to the ICC and the Board in numerous cases; (d) the development of evidence in abandonment cases before the ICC; (e) the development of net liquidation values and rehabilitation costs for interested parties in abandonments and acquisitions; and (f) the preliminary design (including route layout), construction and maintenance costs associated with the construction of a new rail line.

Prior to joining L. E. Peabody & Associates, Inc., Mr. Stedman was employed by the United States Railway Association ("USRA") where he monitored the effectiveness of the operating plan of Consolidated Rail Corporation ("Conrail") using a computer model, participated in data manipulation and analyzed results in order to make projections about Conrail's future operations.

Mr. Stedman also worked as the chief research assistant on a transportation project for the Maryland Department of Transportation and was the co-author of the resulting Report

"International Air Cargo Potential at Baltimore-Washington International Airport." Recommendations in this Report were used to increase international air cargo shipment volumes through Baltimore-Washington International Airport. And, as a research assistant for the ICC, Mr. Stedman studied the effect of selected railroad mergers on the national railroad system using a computer model to aid in determining shifts in traffic patterns caused by specific rail mergers.

Mr. Stedman is a graduate of the University of Maryland where he obtained a Bachelor of Arts degree in Political Science with a minor in Business Transportation. He has attended numerous railroad construction and maintenance seminars across the country and is a Certified Track Foreman and a member of the American Railway Engineering and Maintenance-of-Way Association.

Mr. Stedman has conducted several field inspections of eastern and western carriers' rail lines in order to develop and determine the existing and potential operating and economic conditions of these lines. He has also conducted and directed detailed research into the valuation records of major eastern and western railroads. This research entailed, among other things, detailed reviews of both ICC and railroad valuation maps, land acquisition records (including title status and market value) and the ICC's Bureau of Valuation B.V. Form No. 561, commonly referred to as the ICC Engineering Reports.

VERIFICATION

I, Charles A. Stedman, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Charles A. Stedman

Executed on April 27, 2012

7. MICHAEL E. LILLIS

Mr. Lillis is a Vice President of L.E. Peabody & Associates, Inc., an economic consulting firm that specializes in solving economic, marketing, and transportation problems. The Firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, VA, 22314, 760 E. Pusch View Lane, Tucson, AZ 85737 and 21 Founders Way, Queensbury, NY 12804. Mr. Lillis is co-sponsoring along with Thomas D. Crowley, Part III-A-3.

Mr. Lillis received a Bachelor of Arts degree in economics from the University of Virginia in 1985. He has taken continuing education courses in law at the University of Virginia and has taken numerous graduate courses while enrolled in the MBA program at George Washington University.

Mr. Lillis has been employed by L.E. Peabody & Associates, Inc. since 1995. Prior to joining L. E. Peabody & Associates, Inc., Mr. Lillis worked for Western Fuels Association, Inc., ("WFA") a national fuel supply organization in the electric utility industry. While with WFA, he managed coal supply and rail transportation agreements for shippers that represented the membership of WFA. He organized and presented numerous economic studies and analyses for shippers relating to coal transportation, coal supply and related economic and regulatory problems. Mr. Lillis has negotiated, implemented and monitored both long term coal supply and rail transportation agreements. Mr. Lillis has conducted field trips to coal suppliers in Wyoming's Powder River Basin and New Mexico's San Juan Basin to develop on-site information used in the quantification of contract provisions and the development of operational mine costs.

While at L.E. Peabody & Associates, Inc., Mr. Lillis has participated in studies that utilize various formulas employed by the Surface Transportation Board ("STB") in the development of costs for common carriers, including the Uniform Railroad Costing System ("URCS"). He has developed variable costs for common carriers with particular emphasis on the general purpose costing system for rail carriers. Mr. Lillis has also performed extensive analyses in the area of stand-alone costing including route layout, design and construction costs, traffic and revenue development, forecasting and the development of detailed operating plans for various stand-alone railroads.

As part of his work at L.E. Peabody & Associates, Inc., Mr. Lillis conducted numerous studies for electric utilities regarding least cost alternatives for coal and natural gas delivery to various power plants. These studies included the valuation of existing contractual arrangements for fuel supply and transportation service, the evaluation of alternative fuel sources and transportation options (including trucking coal from nearby railroad locations, rail build-out to a competing railroad and conveyor delivery) and the development of operating characteristics and the associated operating and investment costs for each alternative. He has also developed numerous forecasts of coal prices, natural gas prices, freight rates and general economic indicators for electric utilities.

VERIFICATION

I, Michael E. Lillis, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Michael E. Lillis

Executed on April 27, 2012

8. DANIEL L. FAPP

Mr. Fapp is a Vice President of L.E. Peabody & Associates, Inc., an economic consulting firm that specializes in solving economic, transportation, marketing, and fuel supply problems. The Firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, VA, 22314, 760 E. Pusch View Lane, Tucson, AZ 85737 and 21 Founders Way, Queensbury, NY 12804. Mr. Fapp is co-sponsoring the RTC modeling component of Part III-C with Mr. William W. Humphrey. Mr. Fapp is also co-sponsoring Part III-G, the discounted cash flow analysis and Part III-H, the results of the SAC analysis with Mr. Thomas D. Crowley.

Mr. Fapp received a Bachelor of Science degree in Business Administration with an option in Marketing (cum laude) from the California State University, Northridge in 1987. In 1993, he received a Master of Business Administration degree specializing in finance and operations management from the University of Arizona's Eller College of Management. He is also a member of Beta Gamma Sigma, the national honor society for collegiate schools of business.

Mr. Fapp has been employed by L. E. Peabody & Associates, Inc. since December 1997. Prior to joining L. E. Peabody & Associates, Inc., he was employed by BHP Copper Inc. in the role of Transportation Manager - Finance and Administration, where he also served as an officer of the three BHP Copper Inc. subsidiary railroads: The San Manual Arizona Railroad, the Magma Arizona Railroad (also known as the BHP Arizona Railroad) and the BHP Nevada Railroad. Mr. Fapp has also held operations management positions with Arizona Lithographers in Tucson, AZ and MCA-Universal Studios in Universal City, CA.

While at BHP Copper Inc., Mr. Fapp was responsible for all financial and administrative functions of the company's transportation group. He also directed the BHP Copper Inc. subsidiary railroads' cost and revenue accounting staff, and managed the San Manuel Arizona

Railroad's and BHP Arizona Railroad's dispatchers and the railroad dispatching functions. He served on the company's Commercial and Transportation Management Team and the company's Railroad Acquisition Team, where he was responsible for evaluating the acquisition of new railroads, including developing financial and economic assessment models. During his time with MCA-Universal Studios, Mr. Fapp held several operations management positions, including Tour Operations Manager, where his duties included vehicle routing and scheduling, personnel scheduling, forecasting facilities utilization, and designing and performing queuing analyses.

As part of his work for L.E. Peabody & Associates, Inc., Mr. Fapp has performed and directed numerous projects and analyses undertaken on behalf of utility companies, short line railroads, bulk shippers, and industry and trade associations. Examples of studies which he has organized and/or directed include, traffic, operational and cost analyses in connection with the rail movement of coal, metallic ores, pulp and paper products, and other commodities. He has also analyzed multiple car movements, unit train operations, divisions of through rail rates and switching operations throughout the United States. The nature of these studies enabled him to become familiar with the operating procedures utilized by railroads in the normal course of business.

Since 1997, Mr. Fapp has participated in the development of cost of service analyses for the movement of coal over the major eastern and western coal-hauling railroads. He has conducted on-site studies of switching, detention and line-haul activities relating to the handling of coal. He has also participated in and managed several projects assisting short-line railroads. In these engagements, he assisted short-line railroads in their negotiations with connecting Class I carriers, performed railroad property and business evaluations, and worked on rail line abandonment projects.

Mr. Fapp has been frequently called upon to perform financial analyses and assessments of Class I, Class II and Class III railroad companies. In addition, he has developed various financial models exploring alternative methods of transportation contracting and cost assessment, developed corporate profitability and cost studies, and evaluated capital expenditure requirements. He has also determined the Going Concern Value of privately held freight and passenger railroads, including developing company specific costs of debt and equity for use in discounting future company cash flows.

His consulting assignments regularly involve working with and determining various facets of railroad financial issues, including cost of capital determinations. In these assignments, Mr. Fapp has calculated railroad capital structures, market values, cost of railroad debt, cost of preferred railroad equity and common railroad equity. He is also well acquainted with and has used the commonly accepted models for determining a firm's cost of equity, including single-stage and multi-stage Discounted Cash Flow models ("DCF"), Capital Asset Pricing Model ("CAPM"), Farma-French Three Factor Model and Arbitrage Pricing Model.

In his tenure with L. E. Peabody & Associates, Inc., Mr. Fapp has assisted in the development and presentation of traffic and revenue forecasts, operating expense forecasts, and DCF, which were presented in numerous proceedings before the STB. He presented evidence applying the STB's stand-alone cost procedures in a number of rail proceedings before the STB. He has also presented evidence before the STB in Ex Parte No. 661, *Rail Fuel Surcharges,* in Ex Parte No. 664, *Methodology To Be Employed In Determining the Rail Road Industry's Cost of Capital,* in Ex Parte No. 664 (Sub-No. 1), *Use Of A Multi-Stage Discounted Cash Flow Model In Determining The Railroad Industry's Cost of Capital*, and in Ex Parte No. 558 (Sub-No. 10), *Railroad Cost of Capital – 2006*, Ex Parte No. 661 (Sub No. 11), *Railroad Cost of Capital –*

2007, and Ex Parte No. 661 (Sub No. 12), *Railroad Cost of Capital – 2008.* In addition, his reports have been used as evidence before the Nevada State Tax Commission.

VERIFICATION

I, Daniel L. Fapp, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Daniel L. Fapp

Executed on April 27, 2012

9. ROBERT D. MULHOLLAND

Mr. Mulholland is a Vice President of L.E. Peabody & Associates, Inc., an economic consulting firm that specializes in solving economic, marketing, and transportation problems. The Firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, VA, 22314, 760 E. Pusch View Lane, Tucson, AZ 85737 and 21 Founders Way, Queensbury, NY 12804. Mr. Mulholland along with Thomas D. Crowley is sponsoring Part III-A-1.

Mr. Mulholland received a Bachelor's degree in Government & Legal Studies from Bowdoin College in 1995. In 2004, he received a Master's degree in Transportation Policy, Operations & Logistics from George Mason University's School of Public Policy.

Mr. Mulholland was employed by L.E. Peabody & Associates, Inc. from 1995 through 2004 and rejoined the Firm in 2008. In 2004, Mr. Mulholland joined the Federal Highway Administration ("FHWA") where he directed the freight economics and freight infrastructure delivery programs for the Office of Freight Management & Operations of the FHWA. While employed at FHWA, Mr. Mulholland was a member of the United States Department of Transportation ("USDOT") inter-agency working group that drafted the current National Freight Policy. In addition, Mr. Mulholland served on the USDOT Freight Gateway Team, a group headed by the Undersecretary for Policy and composed of one representative from each of the surface modal agencies. In 2006, Mr. Mulholland joined ICF International where he directed and conducted numerous analyses of the trucking and rail industries for Federal transportation agencies including the Federal Motor Carrier Safety Administration ("FMCSA"), the Federal Railroad Administration ("FRA"), and the FHWA. His work included analyses of the current rail and trucking industries and forecasts of future trends in both industries.

As part of his work for L.E. Peabody & Associates, Inc., Mr. Mulholland has developed evidence containing traffic and revenue forecasts for hypothetical stand-alone railroads in several

Surface Transportation Board ("STB") proceedings dealing with the calculation of maximum reasonable rail transportation rates for coal shippers. He has conducted analyses of historical and forecasted coal transportation rates based on contract and tariff provisions and U.S. Government economic data for use in rail transportation contract negotiations. He has developed studies analyzing delivered fuel prices to electric utilities using Federal Energy Regulatory Commission ("FERC") and related data. Mr. Mulholland also conducted studies forecasting the impact of the Union Pacific-Southern Pacific merger on shippers with reduced access to rail competition following the merger, and developed studies analyzing the impact of the 1997-1998 Union Pacific Railroad service crisis on system traffic flows and transit times.

VERIFICATION

I, Robert D. Mulholland, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Robert D. Mulholland

Executed on April 27, 2012

10. TIMOTHY D. CROWLEY

Mr. Crowley is a Vice President of L.E. Peabody & Associates, Inc., an economic consulting firm that specializes in solving economic, marketing, and transportation problems. The Firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, VA, 22314, 760 E. Pusch View Lane, Tucson, AZ 85737 and 21 Founders Way, Queensbury, NY 12804. Mr. Timothy D. Crowley is co-sponsoring DuPont's opening quantitative market dominance evidence in Part II-A-1 with Mr. Thomas D. Crowley.

Mr. Crowley received a Bachelor of Science degree in Management with a concentration in Finance from Boston College in 2001. He graduated cum laude. He has been employed by L.E. Peabody & Associates, Inc. since 2002.

Mr. Crowley has provided analytical support for both market place and litigation projects sponsored by L. E. Peabody & Associates, Inc. The analytical support included the gathering, review and manipulation of data from the major Class I railroads, the Surface Transportation Board and various other government and public sources. Specifically, the analyses conducted by Mr. Crowley have included the development of the transportation costs associated with the movement of chemicals, coal and other products to different destinations located throughout the country.

Mr. Crowley has also assisted in developing the return on road property investment realized by major western railroads for specific sections of rail. These studies were used in variable, avoidable, and stand-alone cost analyses. He has forecasted transportation revenues included in transportation contracts entered into by major companies, taking into account the escalation factors used in specific contracts. Additionally, Mr. Crowley has reviewed virtually all major transportation coal contracts between eastern and western railroads and the major consumers of coal in the United States. The results of this review were presented to the Surface Transportation Board.

Mr. Crowley has experience with the Surface Transportation Board's Simplified Standards For Rail Rate Cases issued in Ex Parte 646 (Sub No. 1). He has done extensive work with the revised guidelines for Non-Coal Proceedings, which incorporates a three benchmark methodology. This methodology includes calculations using the Revenue Shortfall Allocation Method ("RSAM"), in which Mr. Crowley was trained by members of the Surface Transportation Board. Mr. Crowley also has extensive experience with the Surface Transportation Board's recently revised full Stand Alone Cost procedures having developed and sponsored evidence in a number of recent maximum reasonable rate cases based on this constraint.

VERIFICATION

I, Timothy D. Crowley, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Timothy D. Crowley

Executed on April 27, 2012

11. SEAN D. NOLAN

Mr. Nolan is a Vice President of L. E. Peabody & Associates, Inc. an economic consulting firm with offices in Alexandria, VA, Tucson, AZ and Queensbury, NY. Mr. Nolan is co-sponsoring the forecasting aspects of Parts III-A-2 and 3 with Mr. Thomas D. Crowley.

Mr. Nolan received a Bachelor of Arts degree in Psychology with a minor in Economics from Bates College in 1988, and a Master of Business Administration degree from the University of Phoenix in 2006, specializing in managerial accounting. Mr. Nolan first joined the firm of L. E. Peabody & Associates, Inc. in November 1989.

Since 1989, Mr. Nolan participated in the development of cost of service analyses for the movement of coal over the major eastern and western coal-hauling railroads and he has conducted on-site studies of switching, detention and line-haul activities relating to the handling of coal. He has also participated in several projects providing potential build-out opportunities as effective competition in utilities' fuel procurement initiatives. Procurement initiatives have included the purchasing of fuel, transportation services, equipment, and management of inventories. Alternative scenarios have been supported by tailored financial models developed to estimate cost reductions and savings, actual versus budgeted variances, revenue to variable cost of service relationships, cash flows, and break-even and sensitivity analysis.

In his tenure with L. E. Peabody & Associates, Inc., Mr. Nolan collected and analyzed information needed to efficiently calculate rail costs utilizing the Surface Transportation Board's ("STB") Uniform Railroad Costing System ("URCS") to determine the maximum rate a captive shipper should pay based on the STB's constrained market pricing principles, and has supported the development and presentation of traffic and revenue forecasts, operating expense forecasts, and discounted cash-flow models presented in proceedings before the STB.

Mr. Nolan has previously submitted evidence to the STB regarding market dominance issues.

VERIFICATION

I, Sean D. Nolan, verify under penalty of perjury that I have read the Opening Evidence of Total Petrochemicals USA, Inc. in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Sean D Nolan

Sean D. Nolan

Executed on April 27, 2012

12. WILLIAM W. HUMPHREY

Mr. Humphrey is an Assistant Vice President of L. E. Peabody & Associates, Inc. Mr. Humphrey is co-sponsoring DuPont's opening evidence in Part III-C with respect to the simulation of the SARR's operations using the Rail Traffic Controller ("RTC") Model with Mr. Daniel L. Fapp.

Mr. Humphrey received a Bachelor of Science degree in Sociology with a minor in Computer Science from Boston College in 2001. He has been employed by L. E. Peabody & Associates, Inc. since 2002.

Mr. Humphrey has been the lead programmer for numerous cases utilizing the industry-standard RTC Model to simulate various real-world railroad operations over multiple railroads in all parts of the United States. He has used the RTC model to create and analyze railroad systems for capacity analyses, rate cases, infrastructure investment analyses, and various other studies.

Mr. Humphrey has developed Microsoft Visual Studio applications including the Railroad Operations Simulator ("ROS") program used to model railroad operations by using advanced physics models which utilize highly detailed track information, train specific train characteristics, and detailed operational guidelines. He has designed programs that update, analyze, and summarize data originating at the Energy Information Administration. Mr. Humphrey has written programs that organize, analyze, manipulate, and summarize mainframe databases containing various industry data.

Mr. Humphrey has provided analytical support for testimony sponsored by L. E. Peabody & Associates, Inc. through the gathering and manipulation of data originating at the Energy Information Administration, the Surface Transportation Board, the Federal Railroad Administration and other publicly available sources. Specifically, these analyses include the development of the delivered costs of fuels to electric utilities and development of detailed track statistics for various railroads located throughout the United States. Mr. Humphrey has conducted extensive research which has been used to support both fuel supply and transportation analyses developed by L. E. Peabody & Associates, Inc.

VERIFICATION

I, William W. Humphrey, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

William W. Humphrey

Executed on April 27, 2012

13. **RICHARD R. HARPS, MAI, CRE**

Mr. Harps is President of Harps & Harps, Inc., a Real Estate Valuation and Consulting firm. His business address is 1111 14th Street, NW, Suite 600, Washington, DC 20005. Mr. Harps, in conjunction with John Pinto, Elizabeth Vandermause and Daniel Vandermause, is sponsoring the land valuation evidence in Part III-F-1.

Mr. Harps has over 35 years of experience as a real estate appraiser and consultant. He holds the MAI designation from the Appraisal Institute, the CRE designation from the Counselors of Real Estate, and the FRICS designation from the Royal Institute of Chartered Surveyors. Mr. Harps is a certified general real estate appraiser in Maryland, Virginia and the District of Columbia.

Mr. Harps was President of the Washington, DC Association of Realtors in 1985, was a member of the Executive Committee of National Association of Realtors for 1986 and 1987 and is a member of the General Comprehensive Examination Panel of the Appraisal Institute. Mr. Harps was also President of the Washington DC Metropolitan Chapter of the Appraisal Institute in 1994, and member and past President of the Real Estate Counseling Group of America.

Mr. Harps conducted a valuation of the World Bank multi-building complex in Washington, DC, performed valuations of large multi-property ownership for estate tax purposes and valued surface and underground easements for acquisition by the Washington Metropolitan Area Transit Authority. He valued and consulted with the General Services Administration on the disposition of over 500,000 sq. ft. of air rights situated above rail yards in the District of Columbia. Mr. Harps has been qualified as an expert witness on real estate appraisal matters in numerous Federal courts and the District of Columbia.

VERIFICATION

I, Richard R. Harps, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Richard R. Harps

Executed on April 24, 2012

14. JOHN G. PINTO

Mr. Pinto is Founder and President of Rail Trac Associates, a Real Estate Valuation and Consulting firm. His business address is 1111 14th Street, NW, Suite 600, Washington, DC 20005. Mr. Pinto, in conjunction with Richard Harps, Elizabeth Vandermause and Daniel Vandermause is sponsoring the land valuation evidence in Part III-F-1.

Mr. Pinto has over 45 years of experience as a real estate appraiser and consultant. He holds the CRE designation. Mr. Pinto is a licensed Certified General Real Estate Appraiser in Delaware, New York, Georgia, and the District of Columbia.

Mr. Pinto has performed real estate appraisals related to railroad property and rights-of-way for government agencies, railroads, transit authorities and private sector entities. Recent clients include: the District of Columbia Department of Transportation; Florida East Coast Railroad; Rail America; Washington Metropolitan Transportation Authority; Southeastern Pennsylvania Transportation Authority; Maryland State Highway Administration; New Jersey Transit Access Tunnel Project; Virginia Port Authority; Hampton Roads Transit Authority; New York Susquehanna & Western Railway; and the Federal Railroad Administration ("FRA").

Among other projects, Mr. Pinto was Manager, Project Land Requirements for the Northeast Corridor Improvement Program, involving the rehabilitation of the Amtrak System from Washington, DC to Boston, MA; and, on behalf of the FRA, the transfer of the Alaska Railroad to the State of Alaska; The Surface Transportation Board for the analysis of the Merger of the Union Pacific and Southern Pacific Railroads and the Acquisition of Conrail by CSX and Norfolk Southern.

Mr. Pinto is qualified as an expert in real estate appraisal in Federal courts in Connecticut, New York, Maryland and New Jersey and in State courts in Pennsylvania, New Jersey, Rhode Island, New York and Connecticut.

VERIFICATION

I, John G. Pinto, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

John G. Pinto

Executed on April 24, 2012

15. <u>ELIZABETH W. VANDERMAUSE</u>

Elizabeth Vandermause is President of Merit Real Estate Analysis, a Real Estate Valuation and Consulting firm located at 2409 Hannon Court, Ellicott City, Maryland 21042. Ms. Vandermause, in conjunction with Richard Harps, John Pinto and Daniel Vandermause, is sponsoring the land valuation evidence in Part III-F-1.

Ms. Vandermause has over 30 years of experience in real estate appraisal, consulting and real estate sales, including land acquisition for builders and developers. Her appraisal and consulting experience includes appraisals for transportation authorities including the Washington Metropolitan Area Transit Authority (WMATA). She holds the MAI designation from the Appraisal Institute and is a Certified General licensed real estate appraiser in the State of Maryland.

Ms. Vandermause is qualified as an expert in Federal and Baltimore Circuit courts and has provided expert testimony in an arbitration proceeding.

VERIFICATION

I, Elizabeth W. Vandermause, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Elizabeth W. Vandermause

Executed on April 24, 2012

16. DANIEL VANDERMAUSE

Daniel C. Vandermause is Vice President of Merit Real Estate Analysis, a Real Estate Valuation and Consulting firm located at 2409 Hannon Court, Ellicott City, Maryland 21042. Mr. Vandermause, in conjunction with Richard Harps, John Pinto and Elizabeth Vandermause, is sponsoring the land valuation evidence in Part III-F-1.

Mr. Vandermause has 22 years of experience in real estate appraisal, consulting and real estate sales, including land assembly and acquisition for commercial and residential developers. His appraisal and consulting experience includes a broad variety of residential/commercial/ industrial property types in both Maryland and the District of Columbia. Mr. Vandermause is a licensed appraiser in Maryland and the District of Columbia.

Mr. Vandermause also has 16 years of experience in railroad transportation, including CSX Transportation, Fruit Growers Express, Chessie System, Norfolk Southern Railway and Southern Railway System. Mr. Vandermause's rail industry experience includes freight car utilization and distribution, cash flow analysis for freight car purchases, railroad cost and pricing analysis, market research, and computer systems design for equipment utilization and distribution. Mr. Vandermause authored the freight car utilization portion of the Norfolk Southern merger application before the Interstate Commerce Commission.

VERIFICATION

I, Daniel C. Vandermause, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Daniel C. Vandermause

Executed on April 24, 2012

17. JOSEPH A. KRUZICH

Mr. Kruzich is President of J&A Business Consulting, Inc., a firm specializing in information technology and communications. His business address is 209 Violet Drive, Sanibel, FL 33957. Mr. Kruzich is sponsoring evidence related to the SARR's information technology capital (hardware) and personnel requirements and other expenses for the SARR (Part III-D-3-c).

Mr. Kruzich has 38 years of experience in railroad accounting, executive administration and information technology. He began his railroad career with the Chicago, Burlington and Quincy Railroad in 1963 as a tax accountant and was promoted to an internal auditor in 1965. In June of 1968, he joined the Atchison, Topeka and Santa Fe Railroad ("ATSF") as a manager of work control procedures. His job responsibilities included reviewing various work procedures and providing recommendations on how the work processes could be improved to achieve a high degree of efficiency. This position provided him an opportunity to become very familiar with various work processes involved in running a railroad.

From 1973 through 1994, Mr. Kruzich held various positions of increasing responsibility at ATSF and its parent. As Acting Controller of Santa Fe Air Freight Company and head of industrial engineering at ATSF he performed various efficiency studies in the operating, engineering and mechanical departments. Mr. Kruzich also held the position of Director of Budgets for the entire ATSF operating department including engineering, mechanical, transportation and all support groups, and as such was responsible for coordination of all information technology issues with the Information Systems Department that related to the Operating Department. He was responsible for all administration duties related to the Vice President of Operations office as General Director of Administration and as Assistant to the President of ATSF. As Assistant Vice President of Administration in the Information Technology Group he oversaw all budget, administration, special studies and corporate measurements systems. These positions provided him with the opportunity to manage a complete process in developing new systems from beginning to end.

In 1995, Mr. Kruzich joined the Kansas City Southern Railway as Vice President of Administration, where he designed profitability, corporate measurement, revenue forecasting and corporate policy systems. In January 1997, he was promoted to Vice President Telecommunications and CIO. As CIO, Mr. Kruzich led the effort in developing the state-of-the-art railroad transportation system known as MCS ("Management Control System"). This system uses some of the most advanced technology such as MQ workflow, Citrix Metaframe, the latest version of Visual Basic and many other technologies and is designed around the business process.

In January 2000, Mr. Kruzich left the Kansas City Southern Railway and formed Forging Ahead Associates, LLC, recently renamed J&A Business Consulting, Inc. This company provides state-of-the-art services in the areas of strategic planning and the development of web sites and e-business initiatives, evaluates the benefits of outsourcing information technology and business processes, and works with clients to make the initial contacts in developing global market opportunities.

Mr. Kruzich graduated from Northeast Missouri State University (Truman University) in 1962 with a Bachelor of Science degree in Business. In 1984, he received a Masters of Business Administration in Finance from the Keller Graduate School of Management in Chicago, Illinois.

VERIFICATION

I, Joseph A. Kruzich, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Joseph A. Kruzich

Executed on April 27, 2012

18. VICTOR F. GRAPPONE

Mr. Grappone is President of Grappone Technologies P.E. P.C., a consulting firm that specializes in rail signaling and communications including train control systems, technical support and systems integration. His business address is 20 Jerusalem Avenue, Suite 201, Hicksville, NY 11801. Mr. Grappone developed and is sponsoring, DuPont's Opening Evidence with respect to the stand-alone railroad's SARR signal and communications systems as set forth in Parts III-B-4-b and c and III-F-6. Mr. Grappone is also sponsoring, jointly with DuPont Witness Harvey Crouch, the portion of the SARR maintenance-of-way plan relating to Communications & Signals Department personnel as set forth in Part III-D-5-b-ii.

Mr. Grappone has over 31 years of experience with railroad and transit signal and communications systems. His career in this field began in 1978, when he was hired by the Long Island Rail Road ("LIRR") as a Junior Engineer. In early 1981, Mr. Grappone was appointed Assistant Supervisor-Signals for the LIRR, where he was involved in the direct supervision of approximately 50 signal construction employees engaged in the installation and revision of signal systems as part of the LIRR's capital program. His responsibilities included task scheduling, personnel evaluation, on-site supervision and material ordering.

In mid-1984, Mr. Grappone was named Staff Engineer-Projects for the LIRR. In this position he was responsible for providing technical support for signal projects. In early 1987, Mr. Grappone was appointed to the position of Signal Circuit Designer for the LIRR, a position he held until late 1995. As Signal Circuit Designer, Mr. Grappone managed the technical aspects of the LIRR's recently-completed computer-based system that controlled the signal system at Penn Station (New York) and in the adjacent territory. This position also involved the direct supervision of a design team consisting of Signal Circuit Designers, Assistant Signal Circuit

Designers and Draftsmen. In this position Mr. Grappone was also responsible for the application of new technology to signal systems. Specific tasks included:

- Development of specifications for vital microprocessor-based systems for signal applications;
- Implementation of formalized procedures for performing FRA-mandated tests for signal systems;
- Development of a PC-based graphical control system; and
- Implementation of the first use of programmable logic controllers (PLC's) for the supervisory control functions.

From late 1995 to early 2001, Mr. Grappone held other positions involving signal and communications controls systems at the LIRR, including Acting Engineer – Signal Design, Project Manager responsible for developing and implementing a corporate signal strategy to direct all LIRR signaling efforts over a 20-year period, Principal Engineer – Signal Maintenance and Construction, and Principal Engineer – Communications Based Train Control ("CBTC"). In the latter position Mr. Grappone was responsible for the management and technical direction of the LIRR's CBTC program. In all of these positions, Mr. Grappone was responsible for signal and communications matters involving LIRR's lines that had heavy volumes of both passenger and freight rail traffic.

In May of 2001, Mr. Grappone left the LIRR and formed his own consulting firm, Grappone Technologies, Inc. GTI was reincorporated as Grappone Technologies PE PC in 2007. Major projects Mr. Grappone and his firm have undertaken include:

- Signal design for the New York City Transit Canarsie Line CBTC project, Auxiliary Wayside System.
- Design of office route verification logic for New York City's ATS (Automatic Train Supervision) project.
- Signal circuit checking for the reconfiguration of Harold interlocking on the Long Island Rail Road under the East Side Access project.

- Preparation of specifications and provision of technical and field support for other signal and communications projects for heavy rail and light rail transit systems in the Northeast.

- Circuit design for signal system revisions associated with the reconstruction of five stations on New York City Transit's Brighton Line.

During the course of his consulting work Mr. Grappone has applied for and obtained two patents involving train control systems, including U.S. Patent #6,381,506 for a programmable logic controller-based vital interlocking system (issued April 30, 2002) and U.S. Patent #6,655,639 for a broken rail detector for Positive Train Control (PTC)/CBTC applications (issued December 2, 2003).

Mr. Grappone has been a member of the Eastern Signal Engineers Association since June 1999 (inactive member since June 2001). He is presently a member of the Institute of Electrical and Electronics Engineers, Rapid Transit Vehicle Interface Committee Working Group 2: CBTC; the Communications-Based Train Control User Group; and the FRA's Rail Safety Advisory Committee, Positive Train Control Working Group.

Mr. Grappone obtained a B.S. degree in Electrical Engineering from Rensselaer Polytechnic Institute in 1978.

VERIFICATION

I, Victor F. Grappone, verify under penalty of perjury that I have read the Opening Evidence of E. I. DuPont de Nemours and Company in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Victor F. Grappone

Executed on April 27, 2012