BEFORE THE
SURFACE TRANSPORTATION BOARD

DUKE ENERGY CORPORATION, *Complainant,* v. NORFOLK SOUTHERN RAILWAY COMPANY, *Defendant.*	)	STB Docket No. 42069

DEFENDANT NORFOLK SOUTHERN RAILWAY COMPANY'S
PETITION FOR RECONSIDERATION

James A. Hixon
James A. Squires
George A. Aspatore
Norfolk Southern Corporation
Three Commercial Place
Norfolk, Virginia 23510-2191
(757) 629-2657

G. Paul Moates
Terence M. Hynes
Ronald S. Flagg
Paul A. Hemmersbaugh
Sidley Austin Brown & Wood LLP
1501 K Street, N.W.
Washington, D.C. 20005
(202) 736-8000
(202 736-8711 (fax)

Counsel for Defendant Norfolk Southern Railway Company

DATED: February 23, 2004

TABLE OF CONTENTS

BEFORE THE
SURFACE TRANSPORTATION BOARD

DUKE ENERGY CORPORATION, *Complainant,* v. NORFOLK SOUTHERN RAILWAY COMPANY, *Defendant.*	)	STB Docket No. 42069

DEFENDANT NORFOLK SOUTHERN RAILWAY COMPANY'S PETITION FOR RECONSIDERATION

Pursuant to 49 C.F.R. § 1115.3, Norfolk Southern Railway Company ("NS") petitions the Board for reconsideration of certain material errors in the decision served in the above-captioned proceeding on November 6, 2003 (the "Decision"), as modified by an order served on February 3, 2004 (the "February 3 Decision").

I. TRAFFIC AND REVENUE ($103 Million Average Annual Revenue Overstatement)

NS has identified three principal errors in the February 3 Decision's approach to estimating traffic volumes. First, in calculating ACC traffic volumes for 2002-2004, the Board purported to rely on EIA forecast numbers; however, the Board's workpapers show that the 2002-2004 volumes for CP&L traffic to Hyco and Mayo Creek, NC, and for Duke traffic to Belews Creek, Belmont, Eden and Spencer, NC, adopted in the February 3 Decision are based upon the very NS forecasts the February 3 Decision declares to be inaccurate, and even though the EIA forecasts already reflect EIA's projected changes in Duke and CP&L traffic.[1] See STB E-wp "NEW REVISED REV AND TONS TECH CORRECTIONS.xls". This error alone causes an average annual overstatement of revenues of at least $36 million. Second, despite longstanding Board precedent favoring line-specific actual traffic volume data over more general data, the Decision rejected NS' actual ACC line-specific

[1] With respect to the years 2005-2021, the Board refused to modify the EIA forecast data to reflect more specific information about Duke's future coal usage. Decision at 60.

data for 2002, and instead estimated ACC traffic by applying a ratio derived from preliminary region-wide EIA data to adjust 2001 traffic data. Third, contrary to sound precedent favoring actual data over forecasts, the Board used outdated EIA long-term forecast data to estimate fourth quarter 2002 and full year 2003 ACC traffic, when EIA's actual production data were available for most of that period.

2002 Traffic Volumes. Duke selected an odd hybrid traffic group for the ACC in its Opening Evidence. Specifically, it (1) identified the origin/destination ("O/D") pairs for that group, (2) selected only a portion of the traffic moving between those O/D pairs in 2001, and (3) added the amount of traffic Duke projected to move between those same O/D pairs in 2002, based on an amalgam of the NS 2002 course-of-business forecast plus traffic from 2001 origins (approximately 7 million tons) that was not included in NS' forecast (because that forecast projected such movements would change origins, or cease altogether, in 2002). This approach caused Duke to overstate 2002 traffic to its own plants by nearly 50%. NS Reply at III-A-14 to 15.

NS' Reply estimated 74.1 million tons of ACC 2002 coal traffic (a 9.7% drop from 2001 to 2002).[2] NS' estimate was based upon (1) actual tonnages between the O/D pairs identified by Duke in its Opening evidence for the first six months of 2002 (the period for which actual data were available at that time) and (2) NS' forecast monthly volumes and revenues for the last six months of 2002 (which NS recognized at the time were overstated, but nonetheless were used because tonnages from such forecasts had been used by the STB in prior cases). The Board cited two grounds for rejecting NS' estimates: (1) that NS excluded coal traffic that should have been included in the ACC traffic group as defined by Duke, and (2) that a bias in the NS numbers is demonstrated by the fact that they show a much greater decline in coal carried by the ACC than the average decline in coal

[2] The Board and the parties largely agree that 85.9 million tons (82.1 million of coal and 3.8 million of grain traffic) actually moved over the ACC network in 2001. See STB WP "NEW REVISED REV AND TONS TECH CORRECTIONS.xls;" Duke Reb. WP "NS contractrevprojtarriffsmarshall rebuttal.xls" (showing 86.0 million tons). In the remainder of this section, references will be to coal volumes.

production and traffic for the CAPP region as a whole. Neither is a valid basis for rejecting NS' estimated volumes for 2002.

The Board said it rejected NS' 2002 tonnage because NS did not include all of the coal that could have moved over the lines replicated by the ACC. Although the Board is correct in its statement, the Board should also recognize that exclusion of some coal that could have moved over lines replicated by the ACC is required by the traffic group selected by Duke. NS admits that it had difficulty in determining precisely what traffic Duke had selected, but the Board must recognize that Duke itself affirmatively excluded some of the coal that the ACC could have moved. For example, Duke omitted traffic moving between Delbarton, WV and York Haven, PA; Ramsey, VA and Gary, IN; Gund, KY and Conneaut, OH; Ramsey, WV and Ceredo, WV and Colmont, WV and Hopewell, VA.[3] Notwithstanding any imperfections in NS' attempt to define the precise boundaries of the traffic group selected by Duke, the NS 2002 traffic evidence remains the best estimate. The Board cannot expand the traffic group selected by a complaining shipper and should not give the shipper the benefit of any doubt arising out of the shipper's failure to define with precision the traffic group it has selected. Any tonnage missing from the NS evidence reflecting actual movements of traffic over the ACC network during the first six months of 2002 (due to Duke's lack of precision in the selection of its traffic group) is offset by the overstatement of third and fourth quarter tonnage resulting from NS' use of an overly optimistic internal forecast that coal shipments would increase for those quarters when, in fact, EIA data show a large decrease.[4]

As to the alleged bias in the NS numbers, there is no reason, much less any evidence in the record, to assume that the changes in traffic volumes between 2001 and 2002 over the lines comprising the ACC network (a railroad serving less than 33% of the current production of the

[3] See NS Reply WP "Smalcoal. Y01," included in work paper file "TRAFFIC1.zip"; Duke Reb. WP "NS contractrevprojtarriffsmarshall rebuttal.xls".

[4] According to EIA data, Central Appalachian coal volumes (defined as Eastern KY, Southern WV, and VA) declined 5.6% in the first 2 quarters 2002 compared to the same 2 quarters in 2001, while the last 2 quarters of 2002 observed a 10.2% decline as compared to those quarters in 2001. http://www.eia.doe.gov/cneaf/coal/weekly/weekly_html/archmonth.html and http://www.eia.doe.gov/cneaf/coal/weekly/weekly_html/wcpweek.html.

Central Appalachian region) are the same or similar to changes in region-wide coal production data. To the contrary, the line-specific actual production evidence filed by both NS and Duke showed that coal volumes over the ACC network during 2002 declined far more substantially than the average decline in coal production for the Central Appalachian region as a whole. NS' line-specific traffic data show that coal traffic over the ACC network declined by an estimated 17% during the first six months of 2002.[5] Even Duke's traffic data indicate a 14% decline in traffic over the ACC network during this period.[6]

In sum, NS' evidence projecting 2002 traffic volumes should be adopted as the best evidence of record because (i) it is based on line-specific data;[7] and (ii) the 17% decline reflected in that evidence is supported by Duke's own evidence of the percentage change in ACC traffic. Accordingly, the Board should use 74.1 million tons as its coal traffic projection for 2002.

If the Board nonetheless decides that region-wide EIA data should be used, it should, in addition to correcting the error in its workpapers (in which it used NS internal forecast rather than EIA numbers), revise the tonnage to reflect the actual production data reported by EIA. Although the Decision purported to use the "actual rate of change reported by EIA for Central Appalachian region tonnage from 2001 to 2002" (February 3 Decision at 4), it did not in fact do so. The Board's workpapers indicate that the 5.5% decline in Central Appalachian production upon which the Board relied was derived from the EIA's 2003 Annual Energy Outlook ("AEO"), published in January 2003. See STB WP "NEW REVISED REV AND TONS TECH CORRECTIONS.xls," worksheet

---

[5] See NS Reply WP "ACC Coal Traffic Forecast NS Revised .xls," worksheet "ACC Coal Traffic Forecast"(comparing 50% of 2001 tons to first two quarters 2002 coal tonnages). The far more precipitous decline in 2002 coal traffic over the lines of the ACC than in the Central Appalachian region generally is largely explained by the more than 32% decline of Export, Lake and River traffic in the first six months (approximately 7.3 million tons annualized), which alone causes an annual decline for 2002, when compared to the overall 2001 ACC coal traffic base, of more than 4%. NS Reply WP "NS contractrevprojtarriffsmarshallrevised.xls."

[6] Duke Rebuttal "ACC Rebuttal Coal Traffic Forecast.xls," worksheet "ACC Coal Traffic Forecast" cells X509; Y509 (estimating that the ACC coal traffic would fall from 44.7 million to 38.5 million tons from the first 6 months 2001 to the first 6 months 2002).

[7] See CP&L/NS at 14 ("[m]ore specific evidence is generally preferred over more general evidence").

"Index."[8] Those EIA data do not include the final actual coal production figures for 2002. The EIA's final year-end actual data indicate that Central Appalachian coal volumes fell by 7.9% (not 5.5%) between 2001 and 2002. See Table 1. As is clear from the EIA web-sites cited in footnote 9 below, the EIA publishes actual coal production data every week for the prior week, for the year-to-date, and for the prior 52 weeks. Thus, for example, actual Central Appalachian coal production data for 2002 — reflecting a 7.9% decline in CAPP coal volumes — were available on the EIA's web-site by the second week of January 2003 — prior to the EIA's release of AEO 2003 and more than 11 months before the Decision. To the extent the Board takes "official notice" of government data as the best evidence of actual traffic moving during 2002, it should clearly rely upon the most current and complete government data available.

TABLE 1: EIA Reported Central Appalachian Coal Volumes[9]

	Change in 2002			Change in 2003		
	YE 2001 (000)	**YE 2002 (000)**	**Percent Change**	**12/20/2002 (000)**	**12/20/2003 (000)**	**Percent Change**
Eastern Kentucky	109,427	99,618	-9.0%	97,429	88,845	-8.8%
Southern West Virginia	124,460	116,189	-6.6%	113,569	104,464	-8.0%
Virginia	33,060	30,126	-8.9%	29,368	30,233	2.9%
Total	**266,947**	**245,933**	**-7.9%**	**240,366**	**223,542**	**-7.0%**

Finally, any argument that the use of EIA actual production data for 2002 (or 2003) and EIA forecast data for the period 2004-2021 "mixes apples and oranges" is meritless. The Board has frequently used a combination of actual traffic data (often for Year 1 of a SARR's operations), course of business forecasts (often for Years 2 and 3 of a SARR's operations) and long-term EIA forecasts (generally for Years 4 through 20) — despite the fact that the EIA forecasts included projections for Years 1 through 3 of the SARR's operations. See e.g., Duke/CSX at 44-47 (using actual CSXT traffic data for 2002, CSXT course-of-business forecasts for 2003-2004, and AEO 2003 projections

[8] Because of the considerable lead time EIA requires to produce its long-term AEO forecast, the base year number in a given AEO forecast includes no more than 5-6 months of the base year's actual production numbers. This reflects the fact that the focus of the AEO is the long range forecast — it is not intended as a final report of production in the base year.

[9] http://www.eia.doe.gov/cneaf/coal/weekly/weekly_html/archmonth.html and http://www.eia.doe.gov/cneaf/coal/weekly/weekly_html/wcpweek.html.

for 2005-2021); FMC Wyoming Corp. and FMC Corp. v. Union Pacific at 32 (May 13, 2000) (using UP course-of-business figures and projections for 1997-2002 and AEO 1999 projections for 2003-2017). The Board's precedent in this regard is sound. It makes no sense to ignore actual traffic or production data where available. Moreover, if all other factors are held constant, the lower base year tonnages reflected in the EIA's actual production data would likely reduce projections of future production. The Board does not need to speculate about this issue. The EIA's AEO 2004, in fact, forecasts lower CAPP coal production than does AEO 2003 for the years 2004-2020.[10]

2003 Traffic Volumes. The February 3 Decision (at 4-5) states that to project 2003 levels it used "EIA forecasts rather than NS's internal business forecasts, in view of the demonstrated inaccuracy of the NS forecasts [upon which both NS and Duke had relied] and the general preference for reliance on official, neutral governmental forecasts." NS submits that, if the Board was going to reach outside of the record to project traffic volumes, it should have used EIA actual production numbers (to the extent they were available) rather than EIA forecasts because the actual production numbers are, by definition, more accurate. Because administrative finality requires that the Board establish a cut-off date, NS suggests that EIA actual production data available at least 2 months prior to the decision date be considered by the Board.

To project 2003 volumes for ACC coal traffic, the Board relied upon the EIA January 2003 forecast that Central Appalachian coal production would increase by 0.2% from 2002 to 2003. See STB WP "NEW REVISED REV AND TONS TECH CORRECTIONS.xls," worksheet "Index." However, in relying on this EIA forecast, the Board erroneously ignored EIA data — reflected in Table 1 above — showing that actual Central Appalachian coal production decreased by 7.0% in 2003. Again, to the extent the Board takes "judicial notice" of such official government data as the best evidence of actual traffic moving during 2003, it is indefensible and contrary to Board precedent to rely upon forecasts when actual production data for the same period are available (and demonstrate that the forecasts were significantly inaccurate). As reflected on the EIA's web-site, actual

[10] Thus, for example, while the AEO 2003 forecast was 251.93 million tons for 2004, the AEO 2004 forecast dropped to 221.21 million tons for 2004 — a 12% reduction in CAPP production.

production data for the first eight months of 2003, for example, would have been available in early September, two months in advance of the Board's Decision, so that the Board should have used actual production data for at least the first eight months of 2003.

2004-2021 Traffic Volumes. During the course of the proceedings both parties relied, at least in part, upon forecast data for Central Appalachia from EIA AEO 2002 in order to project traffic volumes for 2004-2021. EIA 2002 projected a cumulative change in CAPP coal production for that period of –14.4%. In its February 3 Decision, to forecast traffic volumes for 2002-2021, the Board reached outside the record and relied upon EIA AEO 2003. For the period 2004-2021, AEO 2003 forecast a cumulative change in CAPP coal production of +4.3%. AEO EIA 2004 was released in January 2004, reflecting a cumulative change in CAPP coal production for 2004-2021 of –7.0%. (http://www.eia.doe.gov/oiaf/aeo/supplement/index.html). NS does not suggest that the Board change its DCF numbers every time EIA issues new production numbers or a new forecast. However, the Board should use the AEO 2004 data, together with AEO 2002 and AEO 2003 forecasts and EIA actual production figures, to decide what projections in the record are most reasonable and what adjustments to those projections (if any) may be appropriate.

Based on the above, the Board should, at a minimum: (1) for 2002, find that ACC coal tonnages are those calculated by NS (74.1 million tons); (2) for 2003, find that 69.9 million tons would be transported by the ACC (2002 tonnage of 74.1 million tons reduced by 5.6% — reflecting the actual decline in CAPP coal production reported by the EIA for the first 8 months of 2003, rather than the 0.2% forecasted increase reported by EIA between 2002 and 2003); and (3) for 2004-2021, apply the EIA percentage change starting with the 2003 tonnage as the base.[11]

[11] Although NS believes that the Board should look at AEO 2002 and 2004, rather than focusing exclusively on AEO 2003, NS has for purposes of consistency with the Board's Decision used AEO 2003 to calculate items (2) and (3) above.

II. ROAD PROPERTY INVESTMENT

A. Rejection of NS Excavation Equipment ($240 Million Error).

The Board should reconsider its acceptance of the excavating equipment Duke introduced for the first time on Rebuttal, and instead adopt the excavator unit costs for common earthwork, loose rock, and solid rock proffered in NS' Reply. The Board properly rejected some of the new earthmoving equipment Duke introduced on Rebuttal (and adopted NS' dump truck hauler and bulldozer) because Duke had not shown that NS' Reply equipment was infeasible or unrealistic. Decision 94. The Board should apply the same rule to reject the excavator Duke substituted on Rebuttal (and adopt NS' excavator unit costs) for the very same reason: Duke abandoned its infeasible opening equipment, and has not shown that the equipment NS proffered on Reply is infeasible or unrealistic.

1. Duke Failed To Meet The Standard for Consideration of New Rebuttal Evidence

After NS' Reply demonstrated that the paddle pan scraper Duke proposed in its case-in-chief was inadequate and infeasible for the required excavation, Duke abandoned it, and on Rebuttal proposed entirely new excavation equipment and methods. See Decision 94. Because Duke's opening excavator was infeasible, the Board's limitations on rebuttal evidence make clear that it must adopt the excavators NS specified in its Reply Evidence, unless Duke's rebuttal demonstrated that NS' excavators are infeasible or unrealistic:

> [W]here on reply the railroad . . . offers feasible, realistic alternative evidence that avoids the infirmities in the shipper's [infeasible] evidence and that is itself supported, the Board will use the [railroad's] reply evidence for its SAC analysis.. . . . [W]here the shipper shows that the railroad's reply evidence is itself unsupported, infeasible, or unrealistic, the shipper may supply corrective evidence.

Decision 14-15 (emphasis added). NS met this standard in its Reply evidence, demonstrating that the excavation equipment it selected was feasible and realistic (see , e.g., NS Reply III-F-21 to 26). Indeed, Duke expressly conceded that NS' Reply equipment was feasible, stating:

> Duke's experts have reviewed NS's evidence and concur that equipment other than that used by Duke *could* be used to accomplish to earthwork requirements for the ACC west of Roanoke. However . . . Duke's experts conclude that the more appropriate equipment to use for

> this operation is not the high-cost equipment selected by NS but rather [the equipment Duke substituted on rebuttal]. This equipment is equivalent to the equipment selected by NS, but . . . is more suitable and results in a lower cost per cubic yard for excavation.

Duke Reb. III-F-42 to 43 (underline emphasis added, italics emphasis in original). Because Duke conceded the feasibility of NS' excavators, the Board must adopt NS' excavating equipment unless Duke demonstrated that such equipment was "unrealistic." See e.g. Decision 14-15.

Duke's claim that the equipment NS selected is intended for digging trenches — the sole basis for the Board's finding that NS' excavating equipment was not realistic — is false. Duke's Rebuttal made a fleeting, unsupported assertion that the general type of equipment associated with one of the excavator unit costs NS selected on Reply was "more useful in digging a trench." See Duke Reb. III-F-43 (citing no support for that assertion). Apparently extrapolating from Duke's erroneous general assertion, the Decision incorrectly surmised that the specific equipment NS selected was "designed primarily for trenching," and further speculated that such equipment would be "relatively inefficient for other [non-trenching] types of excavation." Decision 94; compare Duke Reb. III-F-43. Contrary to Duke's unsupported assertion and the Board's erroneous expansion of the assertion, the evidence shows that the heavy construction equipment that NS selected as its excavators are emphatically not "designed primarily for trenching."

The R.S. Means Heavy Construction Cost Data manual (2002) ("Means") conclusively demonstrates that Duke's unsupported characterization of NS' heavy duty excavators as "trenching tools" is simply wrong. While there are two Means categories for trenching equipment, the equipment NS selected is not listed in the trenching equipment categories. See R.S. Means Categories "Excavating, Trench or Continuous Footing." and "Excavating, Utility Trench." (copies attached as Exhibit A.) Rather, NS selected its excavators from two entirely separate and distinct Means categories, the "Excavating, Bulk Bank Measure, Common Earth Piled" section, and the "Drilling and Blasting Only, Rock, Open Face" section.

NS' Reply designated two excavators — one for solid rock excavation and loading, and one for loose and common earth excavation and loading. First, NS' solid rock excavator is what is

commonly referred to as a "front end loader," with a large 2 ½ cubic yard bucket. See NS Reply WP III-F-0082. That equipment would be used for scooping up the product of blasting (large rocks and boulders) and loading it into dump trucks for hauling away. That equipment is listed in the "Drilling and Blasting Only, Rock, Open Face" section of Means — the category name alone shows that this equipment is intended for large-scale excavation of blasted rock, not for digging "sewer trenches." See NS Reply WP III-F-0082. Moreover, as a matter of common sense, it is difficult to conceive how a front-end loader with a 2 ½-cubic-yard bucket could be used for digging such a trench. Duke's claim that NS' solid rock excavator is a tool for digging sewer trenches is nonsense.

Second, NS' common and loose rock excavator, selected from the "Excavating Bulk Bank Measure, Common Earth Piled" category of Means, is a large excavator on crawling tracks, with a forward-facing hydraulic arm connected to a 3 cubic yard bucket. See NS Reply WP III-F-0082, 0095, 0097. This is precisely the type of equipment commonly used in a variety of heavy excavation and construction projects, not a "trenching tool." Moreover, Duke selected its Rebuttal excavating equipment from the very same Means section that NS used for its common earth excavator. See e.g., Duke Reb. III-F-43 (stating that the equipment Duke selected — from Means "Excavating Bulk Bank . . ." category, "is the type of equipment used for the economical movement of excavated material from the embankment to the haulers) (emphasis added).

In sum, the Board's finding that NS' excavators were inadequate "trenching tools" was based on an unsupported and erroneous (mis)representation in Duke's Rebuttal. Duke's representation is unequivocally refuted by evidence in the record, including Duke's selection of its Rebuttal excavator from the same Means category that lists NS' common and loose rock excavator. The sole basis for the Decision's acceptance of Duke's rebuttal equipment was the erroneous finding that NS' excavators were more suitable for trenching. Decision 94. Because the Decision's rejection of the excavating equipment package NS proffered on Reply (as unrealistic) was erroneous and contrary to clear record evidence, the Board should correct its finding on this important point.

Because Duke's operating equipment was infeasible and NS' Reply equipment is feasible and reasonable, the Board should not even consider the excavator Duke proposed for the first time on

Rebuttal, because that evidence is precluded as a matter of law. See Decision 14-15. As the Board stated in rejecting Duke's other rebuttal equipment, regardless of whether Duke's rebuttal excavator might "have been appropriate to propose on opening, it is not appropriate rebuttal in light of NS' realistic alternative." Decision 94.

2. Duke Did Not Show That Its Rebuttal Excavator Is Feasible or Realistic.

Even if the Board were to consider the new excavator Duke substituted on Rebuttal — which it should not — Duke did not meet its burden of showing that its new excavator would be feasible or realistic for the excavation tasks for which Duke designated it.[12] Indeed, the record evidence does not support a finding that, in the locations and conditions at issue in this case, Duke's new excavator could achieve the production rates and corresponding unit costs Duke claims. Means is intended as an estimating tool that experienced real-world construction contractors may use to estimate the cost of a particular project. Its proper use depends on a contractor's exercise of its own experience and judgment to determine what type and size of equipment is appropriate for the job. It is not intended as a litigation tool, and when used for litigation purposes, it is subject to misuse and distortion. Here, Duke's selection appears to have been focused almost exclusively on minimizing unit costs — selecting from Means an extremely low unit cost associated with the productivity that equipment could theoretically achieve under the conditions for which it was designed — but disregarding the fact that those conditions are radically different from those the builders of the ACC would encounter in constructing a railroad in the Central Appalachian mountains.

[12] Because Duke proffered this new equipment for the first time on Rebuttal, NS was denied the opportunity to submit evidence demonstrating that the equipment associated with the Means unit cost that Duke selected would be infeasible for the work of excavating the ACC roadway in Central Appalachia. Recognizing the fundamental disadvantage such a tactic imposes on an opposing party, the Board's standard for allowing new evidence on rebuttal is appropriately strict. See, e.g., Decision 14-15. If NS had been afforded a fair opportunity to submit responsive evidence, it could have demonstrated that the excavator associated with the unit costs Duke proffered on Rebuttal would be infeasible for the use for which Duke has designated it — scooping up, moving, and loading large, hard rocks and boulders on a long narrow roadbed in the rugged, mountainous, rocky, and heavily wooded terrain the ACC would traverse.

Duke did not submit any documentary evidence to show that the equipment it selected would be feasible or realistic for excavating the ACC roadbed. Unlike NS' Reply evidence, Duke's Rebuttal selected only one excavator to handle two distinct tasks — excavating and loading loose and common earth into dump trucks; and scooping up and loading rocks, boulders, and other materials generated from blasting of solid rock.[13] Duke made no attempt to explain how it could use the same equipment — generating almost the same unit costs — for excavating common and loose earth (which is essentially granular material) from an embankment, and for moving large rocks and boulders. NS selected two different excavators, because its experts determined the same excavator would not be feasible or realistic for these two very different tasks. Duke's use of the same equipment (and nearly the same unit costs) assumes that equipment could achieve nearly the same production rate regardless of whether it was digging soft dirt from a hillside or scooping up, hauling and loading into trucks hard rocks and boulders that have been blasted from solid rock. Although this assumption is contrary to common sense, Duke offered no evidence to carry its burden of proving its Rebuttal excavator could realistically perform either — let alone both — of these disparate tasks.

Similarly, the large difference between the parties' unit costs for rock excavation and loading is largely attributable to Duke's tacit assumption that the product of blasted solid rock would be in the same size range as common and loose earth. This assumption allowed Duke to posit that its excavator would achieve essentially the same productive volume (and hence about the same unit costs) for blasted rocks and boulders as it would for loose and common earth. Compare Duke Reb. III-F-42 to 43 with III-F-49. This assumption is contrary to common sense and experience — as anyone who has passed through a highway rock-cut construction project knows, the product of blasting is a mixture of large rocks, boulders, and smaller rocks, not exclusively fine particles and

[13] As the Board implicitly recognized in adopting NS' dump truck "hauler," acceptance of Duke's blasting costs should have no effect on the determination of the appropriate excavating equipment. The costs and methods of blasting solid rock into large rocks and boulders are entirely separate and independent from the question of what equipment should be used to scoop up and load the resulting rocks and boulders into dump trucks. Moreover, blasting has nothing at all to do with common and loose earth excavation.

pebbles.[14] The Means blasting unit costs Duke relied upon provide no indication that the low-cost blasting Duke selected would generate the extraordinary result of uniformly small particles. And Duke offered no other evidence to suggest that its blasting methods (which the Decision adopted) would generate the uniformly small rocks and particles necessary to achieve the extremely low blasted rock unit costs Duke proffered on Rebuttal. Thus, Duke has failed to meet its burden of proof that the unit costs (and associated equipment) it selected on Rebuttal are feasible and realistic.

Logic, consistency, and the Board's standard for considering new evidence offered on rebuttal all compel the conclusion that the Board should revise the Decision to reject Duke's excavator and adopt the excavating equipment (and associated unit costs) proffered by NS. See Decision 94. Given the Decision's treatment of other grading equipment (see id.), any other conclusion regarding excavating equipment would be arbitrary and capricious.

The effect of adopting the new excavator Duke substituted on Rebuttal, rather than the well-suited excavators designated in NS' Reply, was a substantial overstatement of the amount of earth that could actually be moved in a given time period. This, in turn, significantly understated the correct cost for ACC earthwork. Correcting the Decision to substitute NS' excavating equipment for the infeasible excavator Duke introduced on rebuttal increases ACC earthwork costs (for the territory north and west of Roanoke) by approximately $240 million ($63.5 million for common earthwork and loose rock excavator; and $176.2 million for solid rock excavator), assuming the same engineering and mobilization additives adopted in the Decision. See NS Recon. WP "STB Revised Grading 50-50-Reroute.xls."

[14] NS selected unit costs that are consistent with common construction practice and experience, which is that a significant portion of blasted rock will be fairly large. Thus, the unit costs NS selected cover the excavation and loading of blasted rocks and boulders up to ½ cubic yard in diameter, by a front-end loader suited for the job. The difference between the parties' assumptions regarding the size of blasted materials and the resulting productive rate of their selected equipment accounts for the substantial difference between NS' unit costs of $11.65 per cubic yard, and Duke's unit costs of $1.40 per cubic yard. Compare NS Reply WP III-F-0082 with Duke Reb WP "DUKE/NS 07255.

B. Hauling Costs – Adverse Conditions Adjustment ($101.9 Million Error)

Because the Central Appalachian terrain traversed by the ACC north and west of Roanoke contains some of the most rugged and challenging topography through which a heavy density coal hauling railroad has ever been constructed, NS applied the Means additive for "Rough Terrain or Steep Grades" to the unit costs for hauling excavated materials on that rugged, hilly segment of the SARR. See NS Reply III-F-28. Hauling excavated materials through this rough terrain would be a slow, difficult process, and the standard Means unit costs for hauling do not account for the inevitably lower hauling equipment production rates, and correspondingly higher hauling costs, the builders of the ACC would experience north and west of Roanoke. The hauling activity at issue involves transporting rock and other materials that have been excavated from a section of the proposed ACC right-of-way whose ground elevation is too high for the railroad, to other sections of the proposed ACC right-of-way that are too low, and dumping the excavated materials to partially fill those low spots in the future railroad bed. The terrain between the high elevations and the low elevations that the haulers must traverse is rugged and frequently involves steep grades and narrow ingress and egress. Duke's suggestion that the haulers would travel on a flat roadbed misperceives the process. A level roadbed is the intended end result of this expensive and time-consuming process, not the starting point. At the stage in which the haulers are transporting these excavated materials (which is closer to the beginning than the end of the construction process), and until that process is completed, there is no level roadbed, just steep hills and valleys that must be negotiated by heavy hauling trucks.

NS' experts determined that the terrain and steep grades north and west of Roanoke present a paradigmatic example of the circumstances for which the Means adverse conditions ("rough terrain and steep grades") hauling additive is designed. Although some of the territory south and east of Roanoke is also fairly rugged, NS conservatively applied the adverse conditions additive only to the portions of the ACC to the north and west of Roanoke.[15]

[15] The Board may have decided not to adopt the adverse conditions hauling cost additive because it believed that NS was advocating the application of that additive to all grading costs, rather than simply to hauling costs. See Decision 94 (rejecting the rough terrain unit cost adjustment for

Because the adverse conditions additive is appropriate for the costs of hauling through this extraordinary terrain, and because it appears the Decision's rejection of that additive may have been based on an erroneous understanding of the scope of application of that additive, NS requests that the Board reconsider this aspect of the Decision and apply the adverse conditions additive to hauling costs. This adjustment would increase ACC capital investment by approximately $101.9 million. See NS Recon. WP "STB Construction Technical Correctionsl.xls."

C. Clearing and Grubbing Costs ($42.8 Million Error)

The Decision erred in adopting a unit cost for clearing and grubbing that Duke's own evidence shows is incorrect and infeasible. Based on its adoption of Duke's unit costs for clearing and grubbing trees up to 12 inches in diameter, the Board found that the costs of clearing and grubbing the ACC's heavily forested right-of-way would be $26.59 million. Decision 89-90, Table D-3. id.

The Board's conclusion regarding clearing and grubbing unit costs was based on the premise that the record contained "no support for assuming that 24-inch trees would need to be removed" in the process of clearing the ACC right-of-way. Decision 90. Means provides no intermediate unit cost between the cost of clearing and grubbing trees up to 12" in diameter and the cost of that activity for trees up to 24" in diameter. Once trees exceed 12" in diameter, the appropriate unit cost is that for trees up to 24" in diameter. Thus, the Decision's statement that the record does not show that any 24" trees would need to be removed misperceives the issue. The relevant question is whether the record shows that any trees in excess of 12" in diameter would need to be removed. The answer to that question — even according to Duke — is unambiguously yes. Duke's own evidence acknowledged that 30% of the trees along the ACC right-of-way exceed 12 inches in diameter (Duke Reb. at III-F-23).[16] By definition, the clearing and grubbing equipment Duke selected would be

---

"grading the line north of Roanoke."). This is not correct. NS' evidence applied the adverse conditions additive only to the costs of hauling west of Roanoke, not to the costs of any other earthwork or grading activity. See NS Reply III-F-28; NS Reply WP "III-F 2 Grading.xls" at tab "IIIF Unit Costs."

[16] On Opening, Duke selected a clearing and grubbing unit cost for trees measuring 12" in diameter

infeasible for clearing the ACC right-of-way because it could not remove 1-in-3 trees it would encounter. Correction of this error to reflect the unit costs of the equipment necessary to clear the ACC right-of-way increases ACC road property investment costs by approximately $42.8 million. See NS Recon. WP "STB Construction Technical Corrections.xls."

III. OPERATING PLAN AND COSTS

A. ACC Operating Expenses ($3.7 Million Annual Understatement of Costs)

The Board adopted NS' methodology for calculating ACC operating expenses. Decision 66. NS first calculated operating statistics for the ACC's peak year (which, based upon NS' Supplemental Evidence, would be 2003). See NS Supp. WP "LUMs and Carmiles (NS) v2 (Modified Off Jct).xls." NS then developed base-year operating statistics by multiplying the peak-year operating statistics by the ratio of base-year tons to peak-year tons. See NS Supp. WP "Equipment Counts (Modified Off Jct).xls, worksheet "Operating Expense Inputs."

The Board made two errors in applying this methodology that, in essence, allowed the ACC to carry additional tonnage (i.e., the difference between NS' projected tonnage and the Board's restated tons) at little additional cost. First, the Board developed peak-year operating statistics based on NS' estimate of peak-year traffic (85.9 million tons), rather than the peak-year tons resulting from the Board's restatement of ACC traffic volumes (88.1 million tons). See STB WP "Equipment Counts (Modified Off Jct)-stb.xls." Second, the Board applied an incorrect ratio to those (incorrect) peak-year operating statistics in calculating the ACC's base-year operating statistics. Instead of developing a ratio based on the restated base-year (2002) and peak-year (2008) tons adopted in the

---

or less. NS' Reply demonstrated that equipment capable of removing trees up to 12 inches in diameter would be inadequate to clear the ACC right-of-way, which has many trees that substantially exceed that diameter. See, e.g., NS Reply at III-F-15 to 16. NS conservatively selected the next lowest Means unit cost, for trees up to 24 inches in diameter. See id.; NS Reply WP III-F-16. In its Rebuttal, Duke responded that, based upon its field investigation, approximately 70% of the trees along the ACC right-of-way would be 12 inches in diameter or less. See Duke Reb. III-F-22 to 23. Thus, Duke's own evidence compels the conclusion that clearing the ACC roadway would necessarily require use of the more robust equipment necessary to remove trees up to 24 inches in diameter (i.e. the equipment NS specified in its Reply). See NS Reply at III-F-15 to 16; NS Brief 39.

February 3 Decision, the Board applied a ratio based upon the Board's estimate of 2002 tons and NS' estimate of 2003 tons. See STB WP "Equipment Counts (Modified Off Jct)-stb.xls," worksheet "Operating Expense Inputs ."

NS has recalculated the ACC's peak-year and base-year operating expenses, properly applying the restated traffic projections set forth in the February 3 Decision to the methodology used by NS in preparing its evidence. Specifically, NS calculated peak-year operating statistics based upon the ACC's 2008 tons (the peak-year as determined by the Board). NS then developed the ACC's base-year operating expenses by applying to those peak-year operating statistics a tonnage ratio reflecting the relationship between the ACC's 2002 and 2008 tons (in each case, as restated by the Board). See NS Recon. WP "Equipment Counts (Modified Off Jct)-stb (Corrected).xls." Correcting the Board's errors in calculating peak-year and base-year operating statistics increases the ACC's annual operating expenses by approximately $3.7 million.

B. Retrofitting NS Locomotives For DP Operations ($24.6 Million Error)

The Decision (at 70) excluded from the ACC's locomotive operating expenses the $24.6 million cost of retrofitting NS locomotives with the equipment required to enable them to operate in a Distributed Power ("DP") configuration while on the ACC's lines. The rationale for the Board's ruling — that "NS's proposed operating plan for the ACC assumed that residual NS locomotives would not operate in DP service and would allow time for exchanging ACC and residual NS locomotives" (id.) — is contrary to the record evidence, and inconsistent with the Board's findings elsewhere in the Decision.

Duke's proposed operating plan contemplated that "[a]ll of the ACC's unit train coal traffic that is interchanged to NS ... will be handled in run-through service." Duke Op. III-C-13. NS did not challenge that assumption — indeed, Duke explicitly acknowledged that "NS has accepted the basic premise that run-through power will be used for the ACC's crossover traffic." Duke Reb. III-C-52, n.60 (emphasis added). Nor did NS take issue with the operation of locomotives in a DP configuration on the ACC's lines — to the contrary, NS' operating plan "gave effect to the operating

parameters proposed by Duke (including the use of [DP] at those mines at which Duke proposed to employ DP in its Opening Evidence." NS. Br. 26. See NS Reply Exh. III-C-3.

What NS did object to was Duke's proposal to force NS to receive trains in interchange from the ACC with a rear-end (DP) locomotive attached, because NS does not utilize DP service and would not need the additional unit to move trains on NS' lines. NS Reply III-C-24, III-C- 31 to 32. NS' operating plan therefore contemplated that the "rear end DP units" — not the entire consist, as the Board appears to have assumed (Decision 70) — would be removed from ACC trains prior to interchange to NS, and (conversely) that the ACC would be required to attach a rear-end unit to trains received from NS where DP operation on the ACC's lines was contemplated. Id. Duke's Rebuttal confirmed its understanding that NS's operating plan proposed to remove only the "rear end DP units" from ACC trains interchanged to NS. Duke Reb. III-C-51; see also id. III-C-53 (ACC would add a DP unit to trains received from NS). The Board's assumption that all NS locomotives would be replaced with ACC units at ACC/NS interchange points is contrary to the undisputed record evidence.

The Board's further assumption that NS locomotives would never be required to operate in DP service while on ACC lines is both contrary to the record evidence and inconsistent with the Board's other findings. On Rebuttal, Duke proposed to expand the use of DP service to include all but 6 of the ACC's 39 mine origins (see Duke Reb. Exh. III-C-4; Duke Op. III-C-11-12.). Those mines (Clinchfield, Hatfield, Lavoy, Pardie, Pinnacle Creek and Wantz) account for only 13 percent of the ACC's base-year (2002) tonnage. See STB Decision WP "NEW REVISED REV AND TONS TECH CORRECTIONS.xls," worksheet "REV-TON MILE CALC." The Board found Duke's new approach "reasonable," and based its analysis of ACC track requirements on the wider use of DP service posited in Duke's Rebuttal. Decision 48-49.

In order to serve the majority of ACC mine origins in the manner contemplated by the Decision — i.e., with DP — both NS and ACC locomotives would need to be capable of operating in a DP configuration. In response to NS' showing that it would be difficult to commingle the ACC's all-AC locomotive fleet with NS' DC-based fleet (NS Reply III-C-9-12), Duke suggested that the

ACC could operate trains powered by NS units exclusively "to a mine where a DP configuration is not required." Duke Reb. III-C-18. But the ACC's fleet of 154 road locomotives (Decision 68) would not be adequate to provide service to the 33 mines at which DP service is contemplated. The 290 NS locomotives involved in moving ACC/NS crossover traffic constitute nearly two-thirds of all locomotives employed in ACC/NS interline service. If none of those units could be deployed to a DP-served mine, the ACC would obviously need a larger proprietary fleet than is contemplated by the Decision. Moreover, such an inefficient restriction on the use of NS locomotives would sharply reduce locomotive productivity, and virtually eliminate any benefit derived from run-through locomotive operations.

In order for NS locomotives to operate in DP service on the ACC's lines, those units would have to be equipped for DP operations. The undisputed record evidence shows that the cost of retrofitting 290 NS locomotives for DP operations is approximately $24.6 million. See NS Supp. WP "OP EXP (Modified Off Jct).xls." The Board's failure to include that expense in its calculation of ACC operating costs constitutes material error, because that expenditure is required to carry out the operating plan adopted by the Board. See 49 C.F.R. 1115.3(a)(2).

C. Locomotives for ACC MOW Work Trains ($1.1 Million Error)

The Decision (at 35) adopted NS' proposed operating plan, and accepted "the basic number of road, helper and switch locomotives" specified by NS (albeit with a lower "spare margin" than that proposed by NS (id. 68)). But the Board's workpapers indicate that it eliminated from NS' calculations four locomotives that would be needed to power ACC maintenance-of-way ("MOW") work trains. Compare NS Supp. WP "Equipment Counts (Modified Off Jct).xls" with STB Decision WP "Equipment Counts (Modified Off Jct)-stb.xls."

The Decision (at 80-85) adopted NS' maintenance-of-way plan for the ACC. NS showed that ACC maintenance activities would require approximately 674 work train days per year. NS Reply III-D-115. NS' locomotive calculations added four road locomotives to power those work trains. See NS Supp. WP "Equipment Counts (Modified Off Jct.).xls," worksheet "Operating Expense

Inputs," cell D20 (click on linked calculation). NS did not otherwise take account of work trains in its calculation of road locomotive requirements. Compare NS Supp. WP "LUMs and Carmiles (NS) v2 (Modified Off Jct).xls", worksheet "SUMMARY", cell C46 (162.1 locomotives required to power ACC freight trains) with NS Supp. WP "Equipment Counts (Modified Off Jct).xls," worksheet "Operating Expense Inputs," cell D20 (adding 4 work train locomotives to total in cell C46). The Board's exclusion of these units from its calculation of ACC operating expenses, while otherwise adopting NS' maintenance-of-way plan for the ACC, constitutes material error. NS requests that the Board correct the ACC locomotive count to include four additional units to be used in connection with ACC work trains. Restoring the excluded units increases the ACC's annual locomotive lease expense by approximately $600,000, and its locomotive maintenance expense by approximately $500,000 annually.

CONCLUSION

NS respectfully requests that the Board grant its reconsideration petition, and correct each of the errors identified above. As the workpapers accompanying this petition show, the cumulative impact of those corrections is to require a finding that the challenged rates are reasonable. See NS WP "NS Petition DCF.123".

Respectfully submitted,

James A. Hixon
James A. Squires
George A. Aspatore
Norfolk Southern Corporation
Three Commercial Place
Norfolk, Virginia 23510-2191
(757) 629-2657

G. Paul Moates
Terence M. Hynes
Ronald S. Flagg
Paul A. Hemmersbaugh
Sidley Austin Brown & Wood LLP
1501 K Street, N.W.
Washington, D.C. 20005
(202) 736-8000
(202 736-8711 (fax)

Counsel for Defendant Norfolk Southern Railway Company

DATED: February 23, 2004

CERTIFICATE OF SERVICE

I hereby certify that, on this 23rd day of February, 2004, I served the foregoing "Defendant Norfolk Southern Railway Company's Petition for Reconsideration" by causing five (5) copies thereof to be delivered, via hand delivery, to:

William L. Slover
Robert D. Rosenberg
Christopher A. Mills
Andrew B. Kolesar III
Slover & Loftus
1224 Seventeenth Street, N.W.
Washington, D.C. 20036

Hae-Won Min

02315 | Excavation and Fill

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2002 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
800	3200	300 HP, 100' haul	B-10M	1,150	.010	C.Y.		.30	.90	1.20	1.44	800
	3250	300' haul	"	400	.030			.86	2.59	3.45	4.15	
	3400	460 HP, 100' haul	B-10X	1,680	.007			.20	.82	1.02	1.21	
	3450	300' haul	"	600	.020			.57	2.29	2.86	3.39	
900	0010	**EXCAVATING, TRENCH** or continuous footing, common earth R02315-400										900
	0020	No sheeting or dewatering included										
	0050	1' to 4' deep, 3/8 C.Y. tractor loader/backhoe	B-11C	160	.107	C.Y.		2.92	1.19	4.11	5.75	
	0060	1/2 C.Y. tractor loader/backhoe	B-11M	200	.080			2.19	1.08	3.27	4.54	
	0062	3/4 C.Y. hydraulic backhoe	B-12F	270	.059			1.75	1.69	3.44	4.50	
	0090	4' to 6' deep, 1/2 C.Y. tractor loader/backhoe	B-11M	200	.080			2.19	1.08	3.27	4.54	
	0100	5/8 C.Y. hydraulic backhoe	B-12Q	250	.064			1.89	1.57	3.46	4.58	
	0110	3/4 C.Y. hydraulic backhoe	B-12F	300	.053			1.57	1.52	3.09	4.06	
	0120	1 C.Y. hydraulic backhoe	B-12A	400	.040			1.18	1.41	2.59	3.33	
	0130	1-1/2 C.Y. hydraulic backhoe	B-12B	540	.030			.87	1.31	2.18	2.76	
	0300	1/2 C.Y. hydraulic excavator, truck mounted	B-12J	200	.080			2.36	3.68	6.04	7.60	
	0500	6' to 10' deep, 3/4 C.Y. hydraulic backhoe, 6' to 10' deep	B-12F	225	.071			2.10	2.03	4.13	5.40	
	0510	1 C.Y. hydraulic backhoe	B-12A	400	.040			1.18	1.41	2.59	3.33	
	0600	1 C.Y. hydraulic excavator, truck mounted	B-12K	400	.040			1.18	2.17	3.35	4.17	
	0610	1-1/2 C.Y. hydraulic backhoe	B-12B	600	.027			.79	1.18	1.97	2.48	
	0620	2-1/2 C.Y. hydraulic backhoe	B-12S	1,000	.016			.47	1.70	2.17	2.58	
	0900	10' to 14' deep, 3/4 C.Y. hydraulic backhoe	B-12F	200	.080			2.36	2.28	4.64	6.10	
	0910	1 C.Y. hydraulic backhoe	B-12A	360	.044			1.31	1.56	2.87	3.70	
	1000	1-1/2 C.Y. hydraulic backhoe	B-12B	540	.030			.87	1.31	2.18	2.76	
	1020	2-1/2 C.Y. hydraulic backhoe	B-12S	1,000	.016			.47	1.70	2.17	2.58	
	1030	3 C.Y. hydraulic backhoe	B-12D	1,400	.011			.34	1.50	1.84	2.16	
	1300	14' to 20' deep, 1 C.Y. hydraulic backhoe	B-12A	320	.050			1.48	1.76	3.24	4.17	
	1310	1-1/2 C.Y. hydraulic backhoe	B-12B	480	.033			.98	1.47	2.45	3.11	
	1320	2-1/2 C.Y. hydraulic backhoe	B-12S	850	.019			.56	2	2.56	3.04	
	1330	3 C.Y. hydraulic backhoe	B-12D	1,000	.016			.47	2.09	2.56	3.01	
	1400	By hand with pick and shovel 2' to 6' deep, light soil	1 Clab	8	1			23.50		23.50	36.50	
	1500	Heavy soil	"	4	2			47		47	73	
	1700	For tamping backfilled trenches, air tamp, add	A-1	100	.080			1.88	.61	2.49	3.59	
	1900	Vibrating plate, add	B-18	230	.104			2.52	.24	2.76	4.19	
	2100	Trim sides and bottom for concrete pours, common earth		1,500	.016	S.F.		.39	.04	.43	.64	
	2300	Hardpan		600	.040	"		.96	.09	1.05	1.60	
	2400	Pier and spread footing excavation, add to above				C.Y.				30%	30%	
	3000	Backfill trench, F.E. loader, wheel mtd., 1 C.Y. bucket										
	3020	Minimal haul	B-10R	400	.030	C.Y.		.86	.54	1.40	1.90	
	3040	100' haul		200	.060			1.72	1.07	2.79	3.80	
	3060	200' haul		100	.120			3.43	2.14	5.57	7.60	
	3080	2-1/4 C.Y. bucket, minimum haul	B-10T	600	.020			.57	.62	1.19	1.55	
	3090	100' haul		300	.040			1.14	1.23	2.37	3.10	
	3100	200' haul		150	.080			2.29	2.47	4.76	6.20	
	4000	For backfill with dozer, see div. 02315-120										
	4010	For compaction of backfill, see div. 02315-300										
940	0010	**EXCAVATING, UTILITY TRENCH** Common earth										940
	0050	Trenching with chain trencher, 12 H.P., operator walking										
	0100	4" wide trench, 12" deep	B-53	800	.010	L.F.		.30	.11	.41	.57	
	0150	18" deep		750	.011			.32	.11	.43	.61	
	0200	24" deep		700	.011			.34	.12	.46	.65	
	0300	6" wide trench, 12" deep		650	.012			.37	.13	.50	.70	
	0350	18" deep		600	.013			.40	.14	.54	.76	
	0400	24" deep		550	.015			.43	.16	.59	.83	
	0450	36" deep		450	.018			.53	.19	.72	1.01	
	0600	8" wide trench, 12" deep		475	.017			.50	.18	.68	.96	

02300 | Earthwork

02315 | Excavation and Fill

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2002 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
940	0650	18" deep	B-53	400	.020	L.F.		.60	.22	.82	1.14	940
	0700	24" deep		350	.023			.68	.25	.93	1.30	
	0750	36" deep		300	.027			.79	.29	1.08	1.52	
	0830	Fly wheel trencher, 18" wide trench, 6' deep, light soil	B-54A	1,992	.005	C.Y.		.14	.25	.39	.49	
	0840	Medium soil		1,594	.006			.18	.31	.49	.61	
	0850	Heavy soil		1,295	.007			.22	.38	.60	.75	
	0860	24" wide trench, 9' deep, light soil	B-54B	4,981	.002			.06	.15	.21	.26	
	0870	Medium soil		4,000	.002			.08	.19	.27	.32	
	0880	Heavy soil		3,237	.003			.09	.23	.32	.40	
	1000	Backfill by hand including compaction, add										
	1050	4" wide trench, 12" deep	A-1	800	.010	L.F.		.23	.08	.31	.45	
	1100	18" deep		530	.015			.35	.11	.46	.68	
	1150	24" deep		400	.020			.47	.15	.62	.90	
	1300	6" wide trench, 12" deep		540	.015			.35	.11	.46	.66	
	1350	18" deep		405	.020			.46	.15	.61	.88	
	1400	24" deep		270	.030			.69	.22	.91	1.33	
	1450	36" deep		180	.044			1.04	.34	1.38	1.99	
	1600	8" wide trench, 12" deep		400	.020			.47	.15	.62	.90	
	1650	18" deep		265	.030			.71	.23	.94	1.35	
	1700	24" deep		200	.040			.94	.30	1.24	1.79	
	1750	36" deep		135	.059			1.39	.45	1.84	2.65	
	2000	Chain trencher, 40 H.P. operator riding										
	2050	6" wide trench and backfill, 12" deep	B-54	1,200	.007	L.F.		.20	.16	.36	.48	
	2100	18" deep		1,000	.008			.24	.19	.43	.57	
	2150	24" deep		975	.008			.24	.20	.44	.59	
	2200	36" deep		900	.009			.26	.21	.47	.64	
	2250	48" deep		750	.011			.32	.26	.58	.76	
	2300	60" deep		650	.012			.37	.30	.67	.88	
	2400	8" wide trench and backfill, 12" deep		1,000	.008			.24	.19	.43	.57	
	2450	18" deep		950	.008			.25	.20	.45	.60	
	2500	24" deep		900	.009			.26	.21	.47	.64	
	2550	36" deep		800	.010			.30	.24	.54	.72	
	2600	48" deep		650	.012			.37	.30	.67	.88	
	2700	12" wide trench and backfill, 12" deep		975	.008			.24	.20	.44	.59	
	2750	18" deep		860	.009			.28	.22	.50	.67	
	2800	24" deep		800	.010			.30	.24	.54	.72	
	2850	36" deep		725	.011			.33	.27	.60	.79	
	3000	16" wide trench and backfill, 12" deep		835	.010			.29	.23	.52	.68	
	3050	18" deep		750	.011			.32	.26	.58	.76	
	3100	24" deep		700	.011			.34	.28	.62	.81	
	3200	Compaction with vibratory plate, add								50%	50%	
	5100	Hand excavate and trim for pipe bells after trench excavation										
	5200	8" pipe	1 Clab	155	.052	L.F.		1.21		1.21	1.88	
	5300	18" pipe	"	130	.062	"		1.44		1.44	2.25	
	9100	For clay or till, add up to								150%	150%	
945	0010	**EXCAVATING, UTILITY TRENCH, PLOW**										945
	0100	Single cable, plowed into fine material	B-11Q	3,800	.003	L.F.		.09	.12	.21	.27	
	0200	Two cable		3,200	.004			.11	.15	.26	.32	
	0300	Single cable, plowed into course material		2,000	.006			.17	.23	.40	.52	

02320 | Hauling

200	0011	**HAULING** Excavated or borrow material, loose cubic yards R02315-400										200
	0015	no loading included, highway haulers										
	0020	6 C.Y. dump truck, 1/4 mile round trip, 5.0 loads/hr.	B-34A	195	.041	C.Y.		1.03	1.81	2.84	3.55	
	0030	1/2 mile round trip, 4.1 loads/hr.		160	.050			1.25	2.21	3.46	4.34	