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FOUNDED 1866

October 14, 2008

**By Courier**

Vernon A. Williams  
Secretary  
Surface Transportation Board  
395 E Street, S.W.  
Washington, D.C. 20005



223754

Re: STB 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

Dear Secretary Williams:

Pursuant to the Notice served August 11, 2008, in the above-referenced proceeding, please find enclosed for filing the original and ten (10) copies of the Reply Comments of the Association of American Railroads ("AAR"), including the Reply Verified Statement of Dr Bruce E. Stangle attached thereto.

If you have any questions, please contact the undersigned counsel.

Sincerely,

Richard E. Young

*Counsel for the Association of American Railroads*

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Enclosures

BEFORE THE  
SURFACE TRANSPORTATION BOARD



USE OF A MULTI-STAGE DISCOUNTED  
CASH FLOW MODEL IN DETERMINING  
THE RAILROAD INDUSTRY'S  
COST OF CAPITAL

Ex Parte No. 664  
(Sub-No 1)

223754

REPLY COMMENTS OF THE  
ASSOCIATION OF AMERICAN RAILROADS

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October 14, 2008

**BEFORE THE  
SURFACE TRANSPORTATION BOARD**

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USE OF A MULTI-STAGE DISCOUNTED )  
CASH FLOW MODEL IN DETERMINING )  
THE RAILROAD INDUSTRY'S )  
COST OF CAPITAL )

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Ex Parte No. 664  
(Sub-No. 1)

**REPLY COMMENTS OF THE  
ASSOCIATION OF AMERICAN RAILROADS**

Pursuant to the schedule established by the Board's Notice served August 11, 2008 ("Notice"), the Association of American Railroads ("AAR") and its members respectfully submit these Reply Comments in the above-captioned proceeding. In support of these Reply Comments, the AAR also submits the Reply Verified Statement of Bruce E. Stangle, Chairman, Analysis Group, Inc. ("Stangle Reply V.S."). The AAR filed its initial comments in response to the Notice ("AAR Opening Comments") on September 15, 2008.

**INTRODUCTION AND SUMMARY**

The Board's decision to propose the adoption of the Morningstar/Ibbotson ("Morningstar/Ibbotson") multi-stage DCF model was eminently correct. The Board should adopt the model, for the reasons stated in the August 11 *Notice* and the AAR's Opening Comments. The Morningstar/Ibbotson model is appropriate for use in the Board's proceedings because it is independent and commercially accepted, and has been modified only to the extent necessary to comport with the requirements that the Board announced in its Notice (and in its ANPR).

Significantly, the Board's proposal is unequivocally supported by the U.S. Department of Transportation ("DOT"). The DOT states that it "continues to support generally the use of MS-DCF in conjunction with CAPM to improve the reliability and stability of the Board's cost of

equity calculation, *and supports in particular the Board's choice of the Morningstar/Ibbotson MS-DCF model. DOT recommends that in implementing this decision the STB use a simple average of the two methodologies* " Comments of the U.S. Department of Transportation, filed September 15, 2008 ("DOT Comments") at 1-2 (emphasis added).<sup>1</sup>

By contrast, the various criticisms of the Morningstar/Ibbotson model by the Western Coal Traffic League ("WCTL") are without merit. WCTL distorts the issue here by repeatedly mischaracterizing the model as "the AAR model" (WCTL Comments at 3-4, 13 & n 12, 14, 15 n.14, 18), "the AAR proposal" (*id.* at 5-6), and "the AAR methodology" (*id.* at 17). WCTL, however, cannot change the facts. As the Notice recognizes, the model proposed by the Board is the Morningstar/Ibbotson model, modified only to the extent necessary to reflect the Board's criteria. Notice at 4-5. Far from producing a "variant" of the model, the AAR and Dr. Stangle followed the Morningstar/Ibbotson published documentation as closely as possible in proposing the adoption of the model by the Board. Stangle Reply V.S. ¶ 32

Furthermore, WCTL's current criticisms of the Morningstar/Ibbotson model are inconsistent with its previous praise of – and reliance on – Morningstar/Ibbotson data in the past. For example, WCTL previously used Ibbotson data to calculate the COE for the four largest Class I railroads, calling Ibbotson "a leading provider of financial data [that] was acquired on March 1, 2006 by Morningstar, Inc., a leading provider of independent investment research " WCTL Comments in Ex Parte No. 558 (Sub-No 9), *Railroad Cost of Capital – 2005*, filed April 28, 2006, at 9-10.

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<sup>1</sup>See also DOT Comments at 6 ("The Morningstar/Ibbotson MS-DCF methodology is particularly suitable for use with CAPM for the reasons advanced by the Board"); *id.* at 7 ("Use of the Morningstar/Ibbotson MS-DCF model in conjunction with the recently adopted CAPM methodology should consistently produce" reliable and realistic estimates of the cost of equity).

The particular substantive criticisms of the Morningstar/Ibbotson model by WCTL do not withstand scrutiny. First, many of WCTL criticisms are nothing more than an attempt to re-litigate old battles that WCTL previously lost before the Board, or issues that are untimely because they should have been raised earlier (either in Ex Parte No. 664 or Ex Parte No. 664 (Sub-No. 1)).

For example, WCTL persistently asserts that the Board should have adopted the two multi-stage DCF models that it submitted last April. But the Board made quite clear in its Notice that it rejected WCTL's models because they were developed simply for purposes of this proceeding – unlike the Morningstar/Ibbotson model, which was adopted by independent third parties for use by the financial community.<sup>2</sup> WCTL does not, and cannot, deny that it developed its models solely for purposes of this proceeding.<sup>3</sup>

Even leaving aside the fact that they were expressly created for litigation purposes, the Board was fully justified in refusing to adopt WCTL's models. Both models are flawed and ill-defined. When it presented its models last April, WCTL acknowledged that in developing them, its witnesses had "continued using most elements of their prior MSDCF approach" – *i.e.*, the multi-stage DCF that they presented in WCTL's reply comments in October 2007 in Ex Parte No. 664. *See* WCTL Comments filed April 14, 2008 ("WCTL April 14 Comments"), at 8 &

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<sup>2</sup>*See* Notice at 6 (stating that Board was proposing the Morningstar/Ibbotson model, rather than the "model developed and proposed by [WCTL]," because "we believe it is prudent to use an approach that was not developed simply as a tool for litigation before the Board, but rather to use an approach that has been tested in the marketplace and is used to estimate the cost of equity for different industries, not just the rail industry").

<sup>3</sup>WCTL's own witnesses admitted last April that they developed the two models for this proceeding. *See* Verified Statement of Thomas D. Crowley and Daniel L. Fapp, filed April 14, 2008, at 5 (in response to Board's Notice, ANPR, "we have developed two MSDCF models which meet the STB's modeling criteria").

Hodder V.S. at 3. The AAR's witnesses have previously discussed how WCTL's earlier MSDCF model was seriously flawed and unreliable.<sup>4</sup> WCTL did not show last April, and it does not show now, that its models meet the Board's four criteria.

As part of its relitigation of old battles, WCTL even raises issues that it lost regarding the CAPM methodology in Ex Parte No. 664, such as the allegedly "overstated" market risk premium adopted by the Board. *E.g.*, WCTL Comments at 11 n.9, 21, 24, 28. That issue, and WCTL's other complaints about the CAPM, have no place in this proceeding, where the issue is whether the Board should use a multi-stage DCF "to complement the use of CAPM in determining the railroad industry's cost of capital."<sup>5</sup>

Second, WCTL's substantive criticisms of the Morningstar/Ibbotson model are little more than a scattershot approach. In its haste to make any criticism of the model that it can devise, however, WCTL ignores the fact that the model consists of a number of interrelated parts and assumptions. *See* DOT Comments at 4 n.6 describing the mathematical formula for the model). Changing one assumption of the model would require changing other assumptions in the model; thus, adjusting one part of the model to address WCTL's criticisms would have offsetting effects on other aspects of the model. Stangle Reply V S. ¶¶ 4, 30.

Moreover, WCTL's criticisms are based on the flawed premise that there is a definite, precise way of calculating the cost of equity and a single universally accepted model for estimating the cost of equity. As WCTL's own witnesses have acknowledged, however, "there is no single correct MSDCF model format." Crowley/Fapp V S at 7-8 in Comments of WCTL filed April 14, 2008 ("WCTL April 14 Comments") By necessity, the cost of equity is only an

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<sup>4</sup>*See, e.g.* Transcript of December 4, 2007 hearing in Ex Parte No. 664 ("Hearing Transcript"), at 43-47 (Myers), 53-54 (Stangle).

<sup>5</sup> Notice at 3 (emphasis added), *see also* Advance Notice of Proposed Rulemaking served February 11, 2008, in Ex Parte No. 664 (Sub-No. 1), at 1.

estimate. As the DOT states, “The record in Ex Parte [No.] 664 demonstrated that an attempt to identify one financial model as superior in all respects to others is likely doomed to failure, because each possesses strengths, weaknesses, and some degree of arbitrariness.” DOT Comments at 5 That is why “Economic and financial academic research accordingly tends to favor combining different models in order to obtain results superior to those produced by a single model.” *Id.*

WCTL’s procedural arguments fare no better than its substantive criticisms. WCTL’s argument that the Notice “does not really state or explain what the Board is actually proposing for adoption” (WCTL Comments at 2) is astonishing. The Notice made abundantly clear what the Board is proposing, and WCTL knows full well what that is – adoption of the Morningstar/Ibbotson model, which was fully explained in Dr. Stangle’s testimony and workpapers.

In the final analysis, WCTL dislikes the proposed Morningstar/Ibbotson for the simple reason that “it delivers significantly higher results than under the STB’s CAPM methodology ” WCTL at 3. But if the model is reliable – and it plainly is – WCTL’s unhappiness with the results it generates is no reason for rejecting it.

## **ARGUMENT**

### **I. WCTL’S ATTACKS ON THE “DEFICIENT ASSUMPTIONS IN THE AAR MSDCF PROPOSAL” ARE UNFOUNDED.**

WCTL argues that the Morningstar/Ibbotson model “makes a number of key assumptions that are unwarranted” regarding: (1) the second stage growth rate; (2) the terminal growth rate; (3) the measure of cash flow, and (4) the derivation of five-year growth rates. WCTL Comments at 5-18 WCTL’s criticisms amount to a complaint that the Board should have adopted its models – as reflected by WCTL’s statement that the assumptions of the Morningstar/Ibbotson

model are particularly improper “when compared to those utilized in WCTL’s proposed MSDCF models.” WCTL Comments at 5.

Even leaving aside the obvious lack of merit in its own models, WCTL’s criticisms of the Morningstar/Ibbotson model are baseless. Moreover, as Dr. Stangle shows in his reply statement, the assumptions of the model that are challenged by WCTL either make very little difference in the results of the calculation of COE or can be readily supported. Stangle Reply V.S ¶¶ 4, 17.

**A. The Second Stage Growth Rate**

WCTL contends that the “Ibbotson/AAR model” errs in assuming that earnings growth will “instantaneously revert to the growth rate for the general economy in the eleventh year,” whereas WCTL’s models project a gradual five-year transition to the terminal growth rate. WCTL Comments at 7. WCTL’s argument, however, is based on the premise -- for which WCTL provides no support -- that a model must assume a “gradual transition” in the second stage in order to yield reliable and reasonable estimates. Furthermore, the assumptions in the Morningstar/Ibbotson model were made by Morningstar/Ibbotson, and the model itself has been commercially accepted. See Notice at 5; Stangle Reply V.S. ¶ 20.

Contrary to WCTL’s assertion, the “gradual five-year transition” that it suggests is not “more logical and appropriate on [its] face.” WCTL at 7. WCTL’s suggested approach is only one of many possible alternatives to the assumptions used in the Morningstar/Ibbotson model. Stangle Reply V.S. ¶ 20. Like the Morningstar/Ibbotson approach, WCTL’s suggested approach is not grounded in any evidence specific to the railroad industry. *Id.* Thus, if (as WCTL claims)

the Morningstar/Ibbotson model is flawed because they are not railroad-specific, WCTL's own models suffer from the same deficiency. *See* WCTL Comments at 7.<sup>6</sup>

Moreover, even if WCTL's "gradual approach" was used in lieu of the assumptions in the Morningstar/Ibbotson assumption, it would have only a minor impact on the results of the COE estimate, because the cost of equity estimate is not particularly sensitive to which of the approaches is used. Stangle Reply V.S. ¶ 19. For example, using WCTL's approach would yield a cost of equity for 2006 of 13.93%, as opposed to 14.57% when the assumptions of the Morningstar/Ibbotson model are used. *Id* This difference is reduced by half when the cost of equity estimates of the multi-stage DCF and CAPM models are averaged together. *Id*

WCTL also challenges as unrealistic the "aggressive" assumption of the Morningstar/Ibbotson model that earnings would grow substantially over the first ten years. WCTL at 8-10. WCTL claims that the model's "methodology derives an increased cost of capital due simply to the fact that railroads are able to impose (and are projected to be able to continue imposing) enormous rate increases." *Id* at 9-10. Again, WCTL misses the mark. Even if the growth rates projected by the model are due to rate increases, that does not render them implausible.<sup>7</sup> Because railroad rates have fallen during the more than quarter century since the Staggers Rail Act of 1980 became law, it is hardly unrealistic to assume that rates will increase in the future.

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<sup>6</sup> Unlike WCTL's models, however, the Morningstar/Ibbotson model is consistent with the basic economic principle that absent barriers to entry and product differentiation, competition is expected to equalize returns across firms in an industry over time. Stangle Reply V.S. ¶ 20.

<sup>7</sup>WCTL also overlooks the fact that the growth rates in the second stage of the Morningstar/Ibbotson model are the average of the individual firm rates used in Stage 1 – which, in turn, are the median values of the firms' three- to five-year growth estimates of railroad industry analysts. *See* Stangle Reply V.S. ¶ 18; AAR Opening Comments, Stangle V.S. ¶¶ 13-14. Thus, if the analysts subsequently change their growth projections (for example, due to the current economic situation), the growth rates in Stage 2 would change as well.

## **B. The Terminal Growth Rate**

WCTL criticizes Dr Stangle for using the average annual percentage change in real GDP from 1930 to calculate average real growth. WCTL Comments at 11-12. Once again, however, WCTL is really re-fighting the battle it lost in Ex Parte No. 664 over what growth rate should be used. *See id.* at 11 n.9 (“The STB’s decision to use a very long-term historic measure for the equity or market risk premium under CAPM creates similar problems”). Even leaving that fact aside, WCTL’s criticisms of the terminal growth rate used by the Morningstar/Ibbotson model are without merit.

The multi-stage model advocated by the AAR, and proposed by the Board, uses Morningstar/Ibbotson’s estimates for the long-term growth rate. Stangle Reply V S ¶ 21. The model’s estimate of long-run inflation – one of the two components of the terminal growth rate calculation -- are clearly supported. For example, Morningstar/Ibbotson’s estimate of 2.5% long-term inflation is consistent with the estimates of the growth of the Consumer Price Index contained in the 2008 report of the Trustees of the Social Security Administration (“SSA”), whose projections are favorably cited by WCTL, and with the forecasts derived by the Federal Reserve Bank of Philadelphia in its Survey of Professional Forecasters. *See* Stangle Reply V.S. ¶ 23; WCTL at 12.<sup>8</sup>

Moreover, contrary to WCTL’s assertions, the Morningstar/Ibbotson model’s estimate of long-run real GDP growth is also reasonable. Stangle Reply V.S. ¶ 24. WCTL’s complaint that the model uses growth data from “a historical period of over seventy years” (WCTL Comments at 11) simply ignores the fact that long-term trends are usually informative of future prospects --

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<sup>8</sup> Although WCTL advocates the use of the projections of the Trustees of the SSA, WCTL previously did not use SSA data in its own models for the terminal growth rate. Instead, WCTL used the Blue Chip economic forecast figure of 5% for growth in GDP. *See* WCTL Comments at 12; Stangle Reply V.S. ¶ 17, WCTL April 14 Comments at 8.

a point acknowledged by the Board in its acceptance of the Morningstar/Ibbotson equity risk premium for use in the CAPM. See WCTL Comments at 11; Stangle Reply V.S. ¶¶ 24-25. Estimates of long-run growth in real output vary more widely than estimates for long-run inflation. Because long-run growth is driven by the growth of a number of factors (including employment, hours, and productivity), it is unclear whether long-run growth going forward will increase or decrease relative to its historical trend. Rather than build an economic model of future real GDP growth, Morningstar/Ibbotson has taken the prudent approach of relying on historical growth to inform its estimate of future growth, using data that, according to the Department of Commerce, “provide comprehensive and consistent time series that can be used for measuring the long-term path of the U.S. economy.”<sup>9</sup>

The long-run growth rate used in the Morningstar/Ibbotson model is that published in Ibbotson’s *Stocks, Bonds, Bills, and Inflation* yearbook (“SBBI”), from which the Board uses data for the equity risk premium of the CAPM. Stangle Reply V.S. ¶¶ 21, 25. This growth rate is reasonable and appropriate for use as the terminal growth rate. *Id*

### **C. The Measure of Cash Flow**

WCTL attacks as “simplistic” the Morningstar/Ibbotson model’s definition of cash flows as income before extraordinary items minus capital expenditures plus depreciation and deferred taxes, because: (1) the model does not explicitly account for stock options and stock repurchases, (2) the model fails to account for changes in working capital or changes in outstanding debt; and (3) the model assumes that capital expenditures equal depreciation in the terminal stage. WCTL Comments at 12-17. None of these criticisms withstands scrutiny.

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<sup>9</sup>Stangle Reply V.S. ¶ 24 & n 21 (quoting Bureau of Economic Analysis, U.S. Department of Commerce, *Concepts and Methods of the U.S. National Income and Product Accounts*, July 2008, pp. 1-3).

**Stock Options and Stock Repurchases.** The Morningstar/Ibbotson model does not directly take the exercise of stock options or stock repurchases into account. That, however, is no flaw. The model does not explicitly account for stock options or stock repurchases (or dividends) because it focuses on a broader measure of free cash flow that is potentially available for distribution to equity investors. Rather than assume that these cash flows will actually be paid to equity investors, the model reasonably assumes that investors will ultimately benefit from these cash flows through specific distributions or stock price appreciation. Stangle Reply V.S. ¶ 27.

This assumption is not unique to the Morningstar/Ibbotson model. Indeed, WCTL's own free cash flow model – like any other model based on free cash flows -- does not explicitly account for dividends, stock repurchases, or stock options. *See id.*; WCTL at 13.

**Changes In Working Capital.** Citing substantial fluctuations in working capital for the railroads in recent years, WCTL argues that a “significant deficiency” of the Morningstar/Ibbotson model is the failure of the model's cash flow measure to account for changes in working capital. WCTL Comments at 13-14 & n.13.<sup>10</sup> That, however, is not a deficiency, much less a “significant” one. The model does not include changes in working capital because it focuses on permanent changes in cash flows that are likely to affect shareholder value. It is for that same reason that extraordinary items are excluded from the income measure that is used in the model. Stangle Reply V.S. ¶ 28.

Moreover, the fact that railroads' operating capital fluctuates substantially from one year to another means that they are transitory and, therefore, are unlikely to affect shareholder value

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<sup>10</sup> WCTL also argues that the Morningstar/Ibbotson model should take changes in net debt into account. WCTL Comments at 14 n.13. However, WCTL offers no basis for its position, and there is no evidence that railroads need to change their long-term debt in order to meet the analyst earnings growth projections that are used in the model. Stangle Reply V.S. ¶ 28 n.23.

*Id* For example, even when BNSF's working capital is included in its average cash flow for 2006, BNSF's cost of equity for that year would decrease only slightly, from 14.85% to 14.67% *Id.* ¶¶ 28-29 & Exh. 2; WCTL Comments at 14 n.13.

**The Assumption That Capital Expenditures and Depreciation Will Be Equal.**

Finally, there is no merit to WCTL's criticism of the Morningstar/Ibbotson model's assumption that capital expenditures will be equal to depreciation in the terminal growth stage, even though this assumption may be inconsistent with the actual investment plans of the major railroads. See WCTL Comments at 14-17. In the first place, that assumption is a totally reasonable simplifying assumption which Morningstar/Ibbotson makes for all of the industries that it covers. Stangle Reply V.S. ¶ 31. As WCTL states, the model uses a "general methodology that could be applied across the various sectors of the markets." WCTL Comments at 7.<sup>11</sup> To change the model's assumption as WCTL proposes would require a detailed forecast of company-specific and industry conditions eleven years into the future and beyond. Stangle Reply V.S. ¶ 31. Because no one can make such forecasts with any assurance of accuracy, assuming that all industries grow at the same rate as the overall economy is reasonable. *Id.*

Second, WCTL is incorrect in suggesting that the assumption that capital expenditures equal depreciation necessarily biases the cost of equity upwards. Changing the model's assumption of zero net investment would require offsetting changes in the model, including relaxation of the assumption that the growth rate in the terminal stage would be equal to the long-run growth rate of the overall economy. If that long-run growth rate became sufficiently high, the lower value of the starting cash flow in the terminal stage could be completely offset, thereby *increasing* the cost of equity. *Id.* ¶ 30.

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<sup>11</sup>See also Notice at 5 (the "same model is used by Morningstar to estimate the cost of equity for hundreds of different industries").

Third, WCTL's claim that "the AAR's position" regarding this assumption in this proceeding is inconsistent with its position Ex Parte No. 679 regarding replacement costs is nonsense. See WCTL Comments at 15-17. Contrary to WCTL's assertion, the AAR does not "claim that depreciation will exactly offset capital expenditures after ten years." *Id.* at 15.<sup>12</sup> That assumption is used by Morningstar/Ibbotson in the model – not by the AAR. Stangle Reply V.S. ¶ 31. Although it is likely that capital expenditures will exceed depreciation in the third stage, the AAR proposed the Morningstar/Ibbotson model as it was developed by Morningstar/Ibbotson – including the assumptions made by Morningstar/Ibbotson for purposes of the model. *Id.* ¶¶ 31-32. WCTL cannot consistently criticize the AAR for presenting a "variant" of the model (WCTL Comments at 2) and argue at the same time that the AAR should have modified the model's assumptions.

#### **D. The Derivation of the Five-Year Growth Rates**

WCTL's criticism of the Morningstar/Ibbotson model for deriving data from Ibbotson publications to compute the first five years of the model is baseless. See WCTL at 17-18. As a preliminary matter, WCTL cannot seriously maintain that "the better approach" would be "a continuation of the process that the STB utilized with its prior single-stage [DCF] methodology," where the Board "used a truncated average ... in order to improve accuracy." *Id.* at 17. This

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<sup>12</sup>WCTL's allegation that the assumption in the model is "the AAR's claim" or "the AAR's position" is a verbal sleight of hand. At the beginning of its discussion of this issue, WCTL states that at the terminal stage, the Morningstar/Ibbotson model defines cash flow as income before extraordinary items, "meaning that depreciation, capital expenditures, and deferred taxes (as well as any other adjustments) simply disappear (*or, alternatively, capital expenditures are deemed to equal depreciation*)." WCTL Comments at 14 (emphasis added). WCTL then proceeds to treat this "alternative" as a given, arguing that the AAR's "claim that depreciation will exactly offset capital expenditures" is inconsistent with the AAR's position in Ex Parte No 679. *Id.* at 15-16 (stating that the "railroads maintain that those capital expenditures will be fully funded by depreciation on their past investments after only ten years," and describing the "AAR's claim that depreciation will exactly offset capital expenditures after ten years")

argument is totally inconsistent with the WCTL's persistent attacks on the single-stage DCF in Ex Parte No. 664

Moreover, WCTL's contention that its approach would give "some transparency in terms of the quality of the data" (WCTL Comments at 18) ignores the fact that the Morningstar/Ibbotson methods are transparent, and publicly available. The Morningstar/Ibbotson model has the transparency that the Board is seeking. See Notice at 6 ("the Morningstar/Ibbotson model is a commercially accepted multi-stage DCF model," and its "variables can be estimated from publicly available data"). The Morningstar/Ibbotson documentation that Dr. Stangle used is detailed, and has been consistent over time. Its transparency is evidenced by its continuing acceptance among purchasers of the *Cost of Capital Yearbook*, which describes the Morningstar/Ibbotson three-stage DCF. Stangle Reply V S ¶ 32.

## **II. THE "OTHER DEFICIENCIES" THAT THE WCTL PURPORTS TO FIND IN THE PROPOSED MODEL ARE NOT DEFICIENCIES AT ALL.**

In addition to persistently criticizing the Morningstar/Ibbotson model for its lack of utility with respect to the railroad industry, WCTL criticizes the Board itself for (1) its "excessive focus" on the independence of the model, (2) its "excessive focus" on the lower standard deviation that results when the results of the model are combined with those of the Board-approved CAPM, and (3) its "failure to focus" on the accuracy of the cost of equity results. WCTL Comments at 18-27. WCTL's criticisms, however, only confirm its willingness to make any argument – regardless of its merits and regardless of the Board's past rulings – in order to prevent the adoption of the model.

### **A. The Purported Lack of Utility of the Morningstar/Ibbotson Model**

WCTL repeatedly argues that the Morningstar/Ibbotson model has not been shown to be a reliable estimate of the cost of equity for the railroad industry, or for industries generally.

Thus, WCTL asserts that the model's "underlying assumptions and inputs do not reflect the realities of the railroad industry" (WCTL Comments at 2); "there is no evidence that the Ibbotson approach is commercially relied upon by the financial community with respect to the railroad industry" (*id.* at 4); "there is nothing to suggest that the Ibbotson methodology was developed for, or has been tested for reasonableness against, the railroad industry specifically" (*id.* at 7); and "there has been no demonstration that anyone actually considers the Ibbotson model to be a reliable measure of the cost of capital for the railroad industry specifically or different industries in general" (*id.* at 19).

This argument is illogical. The *Cost of Capital Yearbook*, which describes the Morningstar/Ibbotson model, has been published annually since 1994, and the model has been widely accepted. It has been applied to many different industries, and the estimates are regularly relied on by financial professionals. Stangle Reply V.S. ¶¶ 33-34.<sup>13</sup> As the Board has stated, the model is "commercially accepted," and its variables "can be applied to those railroads that meet the Board's selection criteria." Notice at 6. It has clearly passed the market test for usefulness, and WCTL does not offer any of evidence to the contrary.

Moreover, WCTL has offered no evidence that its models "reflect the realities of the railroad industry," or that they are regarded by third parties as "a reliable measure of the cost of capital for the railroad industry specifically or different industries in general." Stangle Reply V.S. ¶ 17. WCTL cannot do so, since its models were developed only recently -- and only for purposes of this proceeding.

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<sup>13</sup> A widely cited textbook on the cost of capital describes Ibbotson as producing publications which "valuation and corporation finance professionals at all levels have found useful in the estimation of the cost of capital for companies of various industries and sizes." Shannon P. Pratt, *Cost of Capital, Estimation and Applications* (2d ed. 2002), p. 117.

**B. The Board's "Excessive Focus" on Independence**

WCTL does not deny the independence of the Morningstar/Ibbotson model, but instead argues that "there has been no demonstration that anyone actually considers the Ibbotson model to be a reliable measure of the cost of capital for the railroad industry specifically or different industries generally." WCTL Comments at 19. As previously discussed, this argument is simply contrary to the facts.

WCTL also contends that the Board's "sudden focus on a methodology or figure that it can apply 'off the shelf' stands in sharp juxtaposition to its extended efforts to develop its own implementation of the CAPM methodology" and the single-stage DCF methodology. WCTL Comments at 19-20. WCTL's description of the Morningstar/Ibbotson model is simplistic and incorrect. Far from being "substantially less technical or complicated than construction of a CAPM methodology" (*id.* at 20), the Morningstar/Ibbotson methodology is complex to replicate. Even a cursory review of the methodology, as it is described in the DOT's comments, confirms that fact. See DOT Comments at 4 fn.6. It is only because the Morningstar/Ibbotson methodology is well-established, and can be used to calculate COE with publicly available data, that the model can be readily used in Board proceedings.

**C. The Board's "Excessive Focus" on Standard Deviation**

WCTL does not question the AAR's comments, or Dr. Stangle's testimony, that combining the Morningstar/Ibbotson DCF with CAPM produces a lower variance than a forecast relying on the CAPM alone. Instead, WCTL reiterates its unhappiness with the Board-adopted CAPM, complaining that the Board approved a "sort-of-right" CAPM with an "overstated risk premium," and that the Morningstar/Ibbotson model "somehow produces more of a right, or less of a wrong, than CAPM alone in the form of a lower standard deviation." WCTL Comments at 21-22.

Other than offering rhetoric, WCTL produces no evidence to support its position that the results under either CAPM or Morningstar/Ibbotson are “overstated.” The only data that WCTL cites in support of its position is the weighted average cost of capital (“WACC”) computed by third parties – which, as discussed below, has no relevance to the accuracy of the estimates of the cost of equity derived from the Morningstar/Ibbotson model. See WCTL Comments at 22-23 nn. 20-21, 25.

**D. The Board’s “Failure to Focus on Accuracy of the COE Results”**

WCTL argues that the Board should have focused “on whether the results [of a COE methodology] are more accurate, particularly in terms of reflecting the reasonable and legitimate expectations of the investment community,” rather than “on whether a particular COE methodology produces results that have a lower standard deviation or more stability over time.” WCTL at 23. But the Notice makes clear that the Board *did* focus on the accuracy of the results produced by the Morningstar/Ibbotson model. For example, the Board found, based on data presented in the testimony of Dr. Stangle, that “When combined with the CAPM and applied over a sufficiently lengthy historical analysis period, the Morningstar/Ibbotson multi-stage DCF model enhances the precision of the resulting cost-of-equity estimate with a lower variance than a forecast relying on the CAPM approach alone. ... As such, using the average of both CAPM and the multi-stage DCF model produces a more stable and more precise cost-of-equity estimate.” Notice at 5.

Moreover, WCTL ignores the fact that the cost of equity cannot be determined with precision; as the Board has stated, the cost of equity “can only be estimated.” Notice at 2. The Board concluded that the Morningstar/Ibbotson model produced more stable and reliable estimates (particularly when its results were combined with those of the CAPM) That is the

most that the Board could find. The fact that WCTL offers no evidence to contradict the Board's finding only confirms the correctness of the Board's conclusion.

### **III. WCTL'S ARGUMENT THAT "A SOUND MSDCF SHOULD MORE ACCURATELY ESTIMATE THE COST OF CAPITAL" IS FATALLY FLAWED.**

WCTL asserts that the Board, to determine the accuracy of the proposed Morningstar/Ibbotson methodology, should have "compare[d] the MSDCF results with published COC data from the financial community." WCTL Comments at 25. This argument makes no sense. Cost of equity estimates cannot be compared directly with cost of capital estimates, because the cost of equity is only one component of the cost of capital, the cost of debt being the other. Notice at 2. The MSDCF methodology yields a cost of equity estimate that will generally be higher than a weighted average cost of capital estimate, assuming that some weight is given to the cost of debt. *Stangle Reply V.S.* ¶ 5. Thus, comparing the cost of equity with the cost of capital is a classic apples-to-oranges comparison.

Even leaving aside the impropriety of the comparison it urges, the data that WCTL cites do not support its argument that the Morningstar/Ibbotson model (and the CAPM adopted by the Board) result in an "overstated" cost of equity, while WCTL's own models "produce results that are closely aligned with those prepared by respected members of the financial community." WCTL Comments at 25-27. In fact, the "significant information" cited by WCTL, which allegedly shows the "the financial community's perception of the railroad industry COC" (WCTL Comments at 25), demonstrates that WCTL is incorrect. *See Stangle V.S.* ¶ 6.

Although it purports to cite data from "respected members of the financial community," WCTL's argument is significant for what it does *not* cite: the data of the railroads themselves. For example, WCTL conveniently fails to discuss the testimony of railroad officers, in the hearing that the Board held last December in Ex Parte No. 664, regarding their internal

calculations of their cost of capital. These officers testified that the railroads' cost of equity is in the "low double-digit range," *i e*, approximately, 11 to 13 percent, which would result in a cost of capital of 10 to 12 percent using the weighing process adopted by the Board.<sup>14</sup> Those estimates are far higher than those cited by WCTL. *See* WCTL Comments at 25-26 (citing UBS's WACC estimate of 9.5% and the 8.675% "simple average" of the S&P cost of capital figures for the four major railroads). Similarly, the railroads' internal estimates of their cost of equity – which they calculated by using a variety of methodologies, including the DCF model<sup>15</sup> - are far higher than those calculated by WCTL's models. *See* WCTL April 14 Comments, Crowley/Fapp V.S. at 19, Table 7 (9.52% and 9.84%).

Moreover, WCTL's "significant information regarding the financial community's perception of the railroad industry's COC" only confirms that the Board's proposal to use both CAPM and the proposed Morningstar/Ibbotson approach is a prudent one. *Stangle Reply V.S.* ¶ 15. For example, although WCTL relies on a "consensus" WACC figure of 9.5% in a UBS report issued in April 2006 (WCTL Comments at 25), the UBS report states that "[t]he exact WACC of these companies is debatable," and that the 9.5% figure that it used was simply "the closest thing we can find to a consensus." *Stangle Reply V.S.* ¶ 8. The 9.5% figure does not even vary by year, it is used by UBS in evaluating annual railroad earnings over the period from 2002 to 2007. *Id.* WCTL also fails to mention that other investment analysts use a different benchmark. For example, Bear Stearns has used a "cost of capital hurdle rate" of 10% to evaluate annual railroad earnings since 2000. *Id.* ¶ 9.

In any event, the entire premise underlying WCTL's reliance on the UBS data is incorrect. WCTL assumes that the CAPM calculated by the Board – and the resulting cost of

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<sup>14</sup>*See, e.g.*, Hearing Transcript at 139, 143, 152 (BNSF), 144 (UP), 141 (NS).

<sup>15</sup>*Id.* at 114 (NS), 142 (CSX), 143 (BNSF), 144 (UP).

capital -- are already too high (and higher than the UBS "consensus" WACC figure of 9.5%), and that using the Morningstar/Ibbotson multi-stage DCF would produce even higher COEs and COCs. WCTL at 25. WCTL's assumption, however, is based on its comparison of the UBS figure to the Board's WACC estimate for only one year -- 2006. *Id.* ¶ 11. When the comparison covers a longer time period, it is clear that WCTL's assumption is wrong. For the period from 1998 to 2007, the WACC using the Board's CAPM methodology is typically at or below the UBS estimate or the other estimates cited by WCTL. *Id.* ¶¶ 10-12 & Exh. 1.<sup>16</sup> The average WACC over this ten-year period is 9.23% when the CAPM is used to determine the cost of equity, and 9.96% when the average of the CAPM and the Morningstar/Ibbotson model are used. These average WACC estimates are consistent with the estimates on which WCTL relies. *Id.* ¶ 12. Thus, there is no basis for WCTL's assertion that the CAPM, as approved by the Board, results in a WACC that is biased upwards. *Id.* ¶ 10.

WCTL's reliance on Standard & Poor's ("S&P") data on WACC for individual railroads is equally misplaced. *See* WCTL Comments at 26. When the S&P WACC estimates for the four major railroads -- which were computed using the CAPM -- are weighted using 2005 market values (2005 being the appropriate year for comparison), the resulting industry WACC is 8.63%, which is very close to the 8.89% figure that is derived using the Board's CAPM methodology. *Stangle Reply V.S.* ¶¶ 13-14 & n.12. Thus, the S&P data do not support in any material way WCTL's assertion that the "CAPM figures overstate the railroad industry for COC." *Id.* ¶ 14; WCTL Comments at 26

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<sup>16</sup> In computing the WACC for each of these years using the Board-approved CAPM, Dr. Stangle used the cost of debt and debt-equity weights that the Board determined in its annual cost of capital decisions. *Stangle Reply V.S.* ¶ 12.

#### **IV. WCTL'S "APPROPRIATE NEXT STEPS" SHOULD BE REJECTED.**

WCTL asserts that, because of the purported "deficiencies" in the Morningstar/Ibbotson model, "Even assigning as little as one-tenth weight to the MSDCF approach would undermine, rather than improve, the accuracy and reliability of the resulting COE calculation." WCTL Comments at 28. Instead, WCTL proposes that rather than adopt the Morningstar/Ibbotson model, the Board should "give further reconsideration to WCTL's prior proposals" or, alternatively, "rely exclusively on the CAPM, at least until the STB has more experience with the methodology or there is some reason to believe that it is not yielding accurate results." WCTL at 4-5, 27-28.

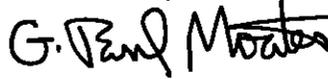
WCTL's proposal should be rejected. The Board has already given full consideration to WCTL's proposed models and correctly found them to be inadequate. Furthermore, as described *supra*, there is no merit in any of WCTL's plethora of criticisms of the Morningstar/Ibbotson model.

Last April, WCTL argued that the Board should not adopt *any* DCF model for at least the next five years, citing the year-to-year fluctuations or lumpiness in the railroads' underlying cash flows (which, WCTL maintained, would pose difficulties for *any* DCF model) and the costs associated with preparing a multi-stage DCF. *See* WCTL Comments filed April 14, 2008, at 2-3, 10-11. Now, apparently recognizing that the reasons it cited would also preclude the adoption of its own multi-stage DCF models, WCTL abandons its prior rationale and urges rejection of a model from the financial data provider (Morningstar/Ibbotson) that it previously cited with approval.

## CONCLUSION

The Board should not tolerate WCTL's gamesmanship. The proposed Morningstar/Ibbotson model should be adopted. Like the CAPM, the Morningstar/Ibbotson model is a widely accepted approach to measuring the cost of equity. By combining and averaging the results of the two models, the Board will obtain a COE estimate that is more reliable and more likely to reflect the fundamental economic conditions of the railroad industry.

Respectfully submitted,



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October 14, 2008

**CERTIFICATE OF SERVICE**

I hereby certify this 14th day of October, 2008, that I have served copies of the foregoing on all parties of record in this proceeding.

RMZ

**BEFORE THE  
SURFACE TRANSPORTATION BOARD**

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USE OF A MULTI-STAGE DISCOUNTED CASH )  
FLOW MODEL IN DETERMINING THE )  
RAILROAD INDUSTRY'S COST OF CAPITAL )

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Ex Parte No. 664  
(Sub-No. 1)

**REPLY VERIFIED STATEMENT  
OF  
BRUCE E. STANGLE  
CHAIRMAN, ANALYSIS GROUP, INC.  
ON BEHALF OF  
ASSOCIATION OF AMERICAN RAILROADS**

October 14, 2008

## **I. INTRODUCTION AND SUMMARY**

- 1. My name is Bruce E. Stangle, and I submitted a verified statement on behalf of the Association of American Railroads (“AAR”) in this proceeding on April 14, 2008. I also participated in STB Ex Parte No. 664 on behalf of the AAR. In that proceeding I submitted joint verified statements with Professor R. Glenn Hubbard on September 27, 2007 and October 29, 2007. Professor Hubbard and I submitted written testimony to the Board on November 27, 2007, and I testified before the Board at a hearing held on December 4, 2007. My background and qualifications are described in my September 27, 2007 verified statement.**
- 2. I have been asked by counsel for the AAR to reply to comments filed by the Western Coal Traffic League (“WCTL”) on September 15, 2008 addressing the Board’s August 11, 2008 proposal “to determine the cost of equity of the railroad industry by using the average of the estimate produced by the CAPM model and the Morningstar/Ibbotson multi-stage DCF model indentified by the AAR.” I also reviewed the comments filed by the Arkansas Electric Cooperative Corporation, the U.S. Department of Transportation, and the AAR.**
- 3. Despite the WCTL’s criticisms, I continue to believe the Board has put forward a sound proposal. In my April 14, 2008 response to the Board’s Advance Notice of Proposed Rulemaking (“ANPR”), I showed that when estimates from the Morningstar/Ibbotson multi-stage DCF model (“MSDCF”) are averaged with the CAPM estimates based on the Board’s methodology, a reasonable set of historical estimates are obtained, and these estimates demonstrate more stability (i.e.. lower standard deviation) over time than either model alone. The WCTL’s comments do not alter my conclusion in any way.**
- 4 As I will discuss in detail below, most of the WCTL’s criticisms are simply incorrect. The rest have little impact on the results because the WCTL fails to consider offsetting effects that would come into play if the Board were to make certain changes recommended by the WCTL.**

## **II. REPLY TO COMMENTS ABOUT MODEL ACCURACY**

5. In reviewing the WCTL comments about model accuracy, it is important to note at the outset that the comments are written in a way that obfuscates the relationship between cost of equity (“COE”) estimates and weighted average cost of capital (“WACC” or “COC”) estimates, which use the cost of equity as an input. For example, the following WCTL statement makes no economic sense if taken literally. “If the STB were truly interested in determining the accuracy of its proposed MSDCF methodology, it would compare the MSDCF results with published COC data from the financial community.”<sup>1</sup> The statement makes no economic sense because the MSDCF methodology yields a cost of equity estimate, which will generally be higher than a weighted average cost of capital estimate, provided some weight is given to the cost of debt. Cost of equity estimates cannot be compared directly with cost of capital estimates
- 6 This is not simply a matter of poor exposition. In defending the cost of equity estimates provided by its experts in earlier submissions, the WCTL states: “Accordingly, use of the WCTL’s MSDCF COE figures would result in a COE very close to that presented by S&P.”<sup>2</sup> As I will discuss in more detail below, the “S&P” figures cited by the WCTL are weighted average cost of capital estimates, not cost of equity estimates. Thus, by equating its cost of equity estimates to WACC estimates produced by S&P, the WCTL inadvertently confirms that its own multi-stage DCF cost of equity estimates are unusually low.
7. Keeping in mind this muddled use of terminology on the part of the WCTL, the core of the WCTL’s criticism is that the cost of equity estimate based on the Board’s recently adopted CAPM methodology already contributes to a weighted average cost of capital estimate that exceeds the true opportunity cost of capital

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<sup>1</sup> “Opening Comments of the Western Coal Traffic League,” in Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry’s Cost of Capital, STB Ex Parte No. 664 (Sub-No. 1), September 15, 2008 (“WCTL Comments”), p. 25

<sup>2</sup> WCTL Comments, p 27.

for railroads. Because the cost of equity estimates from the Morningstar/Ibbotson multi-stage DCF model are the same or higher than the Board's CAPM estimates for the period 1998-2007, the WCTL asserts that averaging the two estimates only serves to move the railroad industry WACC further from the true opportunity cost of capital.<sup>3</sup>

8. The WCTL maintains that the true opportunity cost of capital can be found in "published COC data from the financial community"<sup>4</sup> and cites a railroad industry report from UBS Investment Research dated April 18, 2006 that states: "The exact WACC of these companies is debatable, and the closest thing we can find to a consensus among CFOs and investors is about 9.5%, hence that's the benchmark we're using."<sup>5</sup> This benchmark does not vary by year, and it is used by UBS in evaluating annual railroad earnings over the period 2002-2007. While no details are provided on the methods used by UBS to derive this benchmark or what approaches were used by the individuals that UBS interviewed, the WCTL appears to believe this is a more credible estimate of the railroad industry WACC than one could obtain using the cost of equity from the Board's CAPM or the methodology proposed in this proceeding.
9. The WCTL does not mention that other investment analysts use a different benchmark. For example, in 2007 Bear Stearns Equity Research used a 10%

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<sup>3</sup> There is nothing in the implementation of the Morningstar/Ibbotson multi-stage DCF model that guarantees the estimate will be above the Board's CAPM estimate. In fact, it is likely that at some point in the future the Morningstar/Ibbotson multi-stage DCF estimate will be below the Board's CAPM estimate

<sup>4</sup> WCTL Comments, p. 25. It is rather curious that the WCTL should consider investment analysts the source of truth with respect to COC data but not reliable as sources of railroad earnings forecasts. See, e.g., "Comments of the Western Coal Traffic League," in Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, December 8, 2006, p. 5 ("The Board should also harbor no illusion that the IBES analysts' projections used in the DCF analysis reflect a broad, strong, clear, or even stable consensus across a narrow range of deviation or that the earnings projections are free from very major disparities and substantial volatility").

<sup>5</sup> "When Pigs Fly III. Silk Purses from Sow's Ears," UBS Investment Research. Railroads, April 18, 2006, p. 1, included as Exhibit B in WCTL's July 25, 2007 submission in the 2006 Railroad Cost of Capital proceeding, Ex Parte No. 558 (Sub-No. 10)

“cost of capital hurdle rate” when evaluating annual railroad earnings over the period 2000-2008 <sup>6</sup>

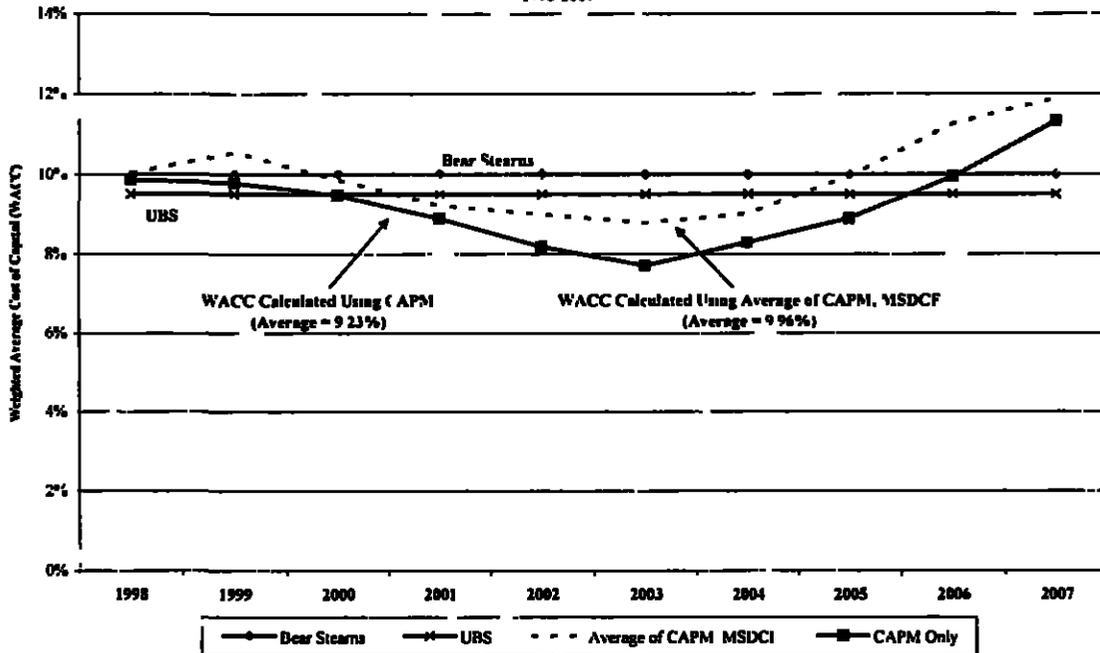
10. Most importantly, when one examines the WACC estimates over time based on the Board’s methodology, there is simply no support for the WCTL’s contention that the Board’s CAPM -- or the proposed average of the CAPM and multi-stage DCF -- yields a cost of equity that consistently pushes the industry WACC above the benchmarks used by investment analysts.
- 11 The WCTL fails to see this because it only compares the UBS benchmark to the Board’s WACC estimate for a single year, 2006 Exhibit I, however, compares the Board’s WACC for each year over the period 1998-2007 with the investment analyst benchmarks. For one set of WACC estimates I use the Board’s CAPM to calculate the cost of equity, and for the other set I use the proposed average of the CAPM and Morningstar/Ibbotson multi-stage DCF In each set, I use the debt-equity weights and the cost of debt from the Board’s final cost of capital decision in the respective year.<sup>7</sup> The data inputs for the WACC calculations are reported in the Appendix to this statement

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<sup>6</sup> “A *Training Manual* Railroads from A to Z,” Bear, Stearns & Co Inc , Equity Research, May 2007, pp. 141-142

<sup>7</sup> For the years 1998-2002 there is also a preferred equity category, and I use the preferred equity weight and cost from the Board’s final cost of capital decision.

**Exhibit 1**  
**WACC Estimates Relative to Investment Analyst Benchmarks**  
**1998-2007**



Source: See Appendix to Stangle Verified Statement, October 14, 2008, for data

12. Exhibit 1 shows that if the Board’s CAPM methodology is combined with the cost of debt and the debt-equity weights that were used in the annual cost of capital decisions, the railroad industry WACC is typically at or below the benchmarks deemed to be informative by the WCTL. The average WACC value over the period 1998-2007 is 9.23% when the CAPM is used to determine the cost of equity, and 9.96% when the average of the CAPM and Morningstar/Ibbotson multi-stage DCF model is used. These average WACC estimates are consistent with the benchmarks used by investment analysts, which was the test for accuracy proposed by the WCTL.<sup>8</sup> Had the WCTL chosen to focus, for example, on either 2003 or 2004, the proposed approach would have led to a WACC estimate below the investment analysts’ benchmarks.

<sup>8</sup> This conclusion also holds for the periods specifically covered in the UBS and Bear Stearns reports. For example, over the period 2002-2007, the average WACC is 9.06% when the CAPM is used to determine the cost of equity, and 9.99% when the average of the CAPM and Morningstar/Ibbotson multi-stage DCF model is used.

13. In addition to the UBS report, the WCTL cites WACC estimates for individual railroads used in a Standard & Poor's stock price report from 2006. The S&P report attempts to determine if the actual share prices for the major railroads during the fall of 2006 represented good values for investors, and the report uses a WACC estimate of 8.6% for Burlington Northern, 9.0% for CSX, 9.1% for Norfolk Southern, and 8.0% for Union Pacific.<sup>9</sup> Taking a weighted average of these estimates yields an industry WACC of 8.63%.<sup>10</sup>
14. While the numerical inputs to the S&P WACC calculations are not spelled out in the report, the cost of equity portion of the WACC is derived from the CAPM. The methodology section of the S&P report states:

The cost of equity is typically derived from the Capital Asset Pricing Model (CAPM), which requires some estimate of the firm's equity market beta. Since the historical beta may bear little relevance for the future, analysts are granted the flexibility to modify their estimates to allow for what they view as realistic assumptions of relative share price volatility going forward.<sup>11</sup>

Consequently, the 8.63% industry WACC can be compared to the 2005 WACC estimate of 8.89% calculated using the Board's CAPM (see Appendix).<sup>12</sup> Once again, the Board's CAPM methodology contributes to a WACC estimate that is very close to that used by investment analysts. Thus, the S&P report cited by the WCTL does not support in any material sense the WCTL's claim that the Board's CAPM overstates the railroad industry's cost of capital.

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<sup>9</sup> The S&P stock price analyses were prepared on November 2, 2006 (BNSF), October 19, 2006 (CSX), November 8, 2006 (NS) and October 23, 2006 (UP), respectively. The S&P reports are included as Exhibit No. 8 in WCTL's July 25, 2007 submission in the 2006 Railroad Cost of Capital proceeding, Ex Parte No. 558 (Sub-No. 10).

<sup>10</sup> The weights used in this average are the sum of the 2005 debt and equity market values reported in the 2005 Railroad Cost of Capital decision, STB Ex Parte No. 558 (Sub-No. 9), p. 18.

<sup>11</sup> Standard & Poor's Stock Appreciation Ranking System (STARS): Methodology, Analysis, & Performance Attribution, June 2005, p. 12, included as Exhibit G in WCTL's July 25, 2007 submission in the 2006 Railroad Cost of Capital proceeding, Ex Parte No. 558 (Sub-No. 10).

<sup>12</sup> The Board's 2005 WACC estimate is the appropriate comparison because the S&P analyses were prepared *during* 2006 and so could not be based on data through the end of 2006. In contrast, the Board's 2006 WACC reflects a cost of equity estimated using stock market data through the end of 2006.

15. Overall, the financial industry reports cited by the WCTL only serve to reinforce the appropriateness of the Board's proposed methodology. The Board's approach to implementing the CAPM clearly does not lead to a cost of equity estimate that is biased upwards, which is the linchpin of the WCTL's argument regarding the accuracy of the Board's proposal.
16. Finally, the WCTL's comments on model accuracy ignore the fact that there is not a single correct approach to measuring the cost of equity. The two models proposed by the Board represent different but widely accepted approaches to measuring the cost of equity. In explaining its support for the Board's proposal, the U.S. Department of Transportation summarized this critical point succinctly: "The record in Ex Parte 664 demonstrated that an attempt to identify one financial model as superior in all respects to others is doomed to failure, because each possesses strengths, weaknesses, and some degree of arbitrariness."<sup>13</sup> In my view, by combining the two models, the Board obtains a cost of equity estimate that is more likely to reflect the fundamental economic conditions of the railroad industry, and is less likely to be unduly affected by specific judgments that are made in implementing the models

### **III. REPLY TO COMMENTS ABOUT MODEL IMPLEMENTATION**

17. In addition to its comments about the accuracy of the Board's proposal, the WCTL maintains that the proposed multi-stage DCF model is improperly implemented and that the "underlying assumptions and inputs do not reflect the reality of the railroad industry." As I will show below, the assumptions challenged by the WCTL either make very little difference to the final result or can be readily supported. Moreover, despite its claims to the contrary, the WCTL has not proposed a multi-stage DCF model that is more tailored to the railroad industry than the Morningstar/Ibbotson model.

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<sup>13</sup> "Comments of the United States Department of Transportation," in *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, STB Ex Parte No 664 (Sub-No 1), September 15, 2008, p 5

- 18. Second stage growth.** The first characteristic of the Morningstar/Ibbotson multi-stage DCF model that is criticized by the WCTL is the second stage growth rate. Instead of using the average of the individual firm growth rates from stage 1, the WCTL proposes that the second stage of the model consist of a linear transition from the first stage growth rate to the terminal growth rate. In its previous submission, the WCTL's experts reduced the second stage growth rate in equal increments so as to transition from stage 1 to stage 3 in 10 years. For example, if the first stage growth rate were 11.0% and the terminal growth rate were 6%, the second stage growth rate would be set to 10.5% in year 6, 10.0% in year 7, 9.5% in year 8, and so on until the terminal rate of 6% is reached in year 15.<sup>14</sup>
- 19.** The WCTL's critique of the second stage growth rate fails to recognize, however, that the resulting cost of equity estimate is not particularly sensitive to which approach is used. For example, using the standard Morningstar/Ibbotson approach to the second stage growth rate yields a cost of equity estimate for 2006 of 14.57%. Replacing this approach with the linearly declining growth rate and the longer transition period used by the WCTL's experts yields a cost of equity of 13.93%, a difference of 64 basis points. However, because the Board proposes to average the multi-stage DCF result with the CAPM estimate, the actual impact on the proposed cost of equity estimate would be only 32 basis points.
- 20.** The WCTL's approach represents just one of many possible alternatives to the assumption used in the Morningstar/Ibbotson model. Neither the WCTL nor Morningstar/Ibbotson approach to handling the second stage growth rate is grounded in facts specific to the railroad industry. However, the

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<sup>14</sup> See Verified Statement of Thomas D. Crowley and Daniel L. Fapp, in Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664 (Sub-No. 1) ("Crowley/Fapp"), April 14, 2008, p. 10 ("Application of the growth adjustment factor to the prior year's growth estimate will lead to a linear change in transition period growth rates until the long-term growth rate is reached in year 15") The WCTL incorrectly described this transition period as lasting only five years. See WCTL Comments, p. 5 ("WCTL suggested a gradual transition or phase-in of the difference between the growth rate for the first stage (years one through five) and the third or final state (year eleven)")

Morningstar/Ibbotson assumption is consistent with the basic economic principle that absent barriers to entry and product differentiation, competition is expected to equalize returns across firms in an industry over time. In contrast, the WCTL's proposed method of scaling down each individual firm's stage 1 growth rate allows differences in growth rates across firms to persist in the second stage.

21. **Terminal growth rate.** The second characteristic of the Morningstar/Ibbotson multi-stage DCF model that is criticized by the WCTL is the terminal (third stage) growth rate. Morningstar/Ibbotson estimates the long-run growth rate by adding the expected growth in real output for the U.S. economy and the expected growth in inflation. The 2008 edition of Ibbotson's *Stocks, Bonds, Bills, and Inflation* ("SBBI") *Valuation Yearbook* estimates the long-run growth in real output to be 3.4% and the long-run expected inflation to be 2.5%, for a long-run nominal growth rate of 5.9%<sup>15</sup>
22. The WCTL does not appear to take issue with the basic approach used by Morningstar/Ibbotson, but rather points to alternative sources that yield lower estimates of long-run nominal growth, such as the 2008 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds ("OASDI Trustees Report"). The WCTL's experts previously used a terminal growth rate of 5.0% based on nominal GDP growth forecasts in the Blue Chip Economic Indicators Report.<sup>16</sup>
23. The Morningstar/Ibbotson estimate of long-run inflation, which is the first part of its terminal growth rate calculation, has clear support. The 2008 OASDI Trustees report favored by the WCTL forecasts the annual increase in the Consumer Price Index ("CPI") to be 2.8% for the period 2020 to 2082.<sup>17</sup> According to the Survey of Professional Forecasters conducted by the Federal

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<sup>15</sup> Ibbotson SBBI, *2008 Valuation Yearbook, Market Results for Stocks, Bonds, Bills, and Inflation 1926-2007* ("SBBI Valuation Yearbook"), Morningstar Inc, pp 69-70.

<sup>16</sup> Crowley/Gapp, April 14, 2008, p 11

<sup>17</sup> 2008 OASDI Trustees report, section V B., Table V B 1, available at <http://www.ssa.gov/OACT/TR/TR08/index.html>

Reserve Bank of Philadelphia, 10-year-ahead forecasts of annual inflation have varied from 2.3% to 2.6% since 1998, and currently stand at 2.5%.<sup>18</sup> Historically, the annual growth rate of the CPI over the period 1926 to 2007 is 3.0%.<sup>19</sup>

24. The Morningstar/Ibbotson estimate of long-run real GDP growth, which is the second part of its terminal growth rate calculation, is also reasonable, but estimates of long-run real GDP growth vary more widely than estimates of long-run inflation. The long-run growth in real output is driven by the growth of employment, hours, and productivity, and the growth of these factors has been the subject of a considerable economic research. For example, the growth of the labor force is expected to slow with the retirement of the baby boom generation, but recent research suggests that productivity growth has increased with developments in information technology.<sup>20</sup> Thus, it is unclear whether the long-run growth in real output going forward will increase or decrease relative to its historical trend. Morningstar/Ibbotson has not taken a position on these advanced economic topics, but instead relies on the historical annual growth in real GDP since 1929.<sup>21</sup> I believe this is a sensible position given the evolving economics literature in the area of long-run potential growth in real GDP.

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<sup>18</sup> Survey of Professional Forecasters long-term inflation forecasts, available at <http://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/historical-data/inflation-forecasts.cfm>.

<sup>19</sup> *Ibbotson SBBI, 2008 Classic Yearbook, Market Results for Stocks, Bonds, Bills, and Inflation 1926-2007*, Morningstar Inc., p. 29.

<sup>20</sup> See, e.g., Dale W. Jorgenson, Mun S. Ho, and Kevin J. Stiroh, "Potential Growth of the U.S. Economy: Will the Productivity Resurgence Continue?" *Business Economics*, January 2006, pp. 7-16.

<sup>21</sup> 2008 SBBI Valuation Yearbook, p. 70. In discussing the way in which GDP data from the National Income and Product Accounts (NIPA) are used, the U.S. Department of Commerce has noted "Since their inception in the 1930s and 1940s, the NIPAs have become the mainstay of modern macroeconomic analysis. They provide comprehensive and consistent time series that can be used for measuring the long-term path of the U.S. economy, for analyzing trends and identifying factors in economic growth and productivity, and for tracking cyclical fluctuations in economic activity." See Bureau of Economic Analysis, U.S. Department of Commerce, "Concepts and Methods of the U.S. National Income and Product Accounts," July 2008, p. 1-3, available at <http://www.bea.gov/national/pdf/NIPAhandbookch1-4.pdf>

25. In my view, the Board would be well served by simply using the long-run nominal growth rate published annually in the SBBI Valuation Yearbook, just as it has chosen to rely on this source for the equity risk premium portion of the CAPM

26 **Cash flow measurement.** The third characteristic of the Morningstar/Ibbotson multi-stage DCF model that is criticized by the WCTL is the construction of the cash flow measure used in the model. The WCTL maintains that the cash flow measure in the Morningstar/Ibbotson model is deficient because: (1) it does not explicitly account for stock options and stock repurchases; (2) it does not account for changes in working capital; and (3) it assumes capital expenditures are equal to depreciation in the terminal stage. The WCTL's critique in this area is poorly reasoned and represents a scattershot of inconsequential issues. I discuss each in turn.

27. *The Morningstar/Ibbotson model does not explicitly account for stock options and stock repurchases because it focuses on a broader measure of free cash flow that is potentially available for distribution to equity investors. Dividend payments, stock repurchases, and stock options are not measured explicitly because the model focuses on the broader cash flow stream that would support these more specific distributions. The WCTL's experts previously submitted a free cash flow model in their April 18, 2008 submission, and that model did not explicitly account for dividends, stock repurchases, or stock options<sup>22</sup> -- no model based on free cash flow does. As I pointed out in my April 18, 2008 verified statement, the DCF model does not assume these cash flows are actually paid to equity investors, but rather that investors will ultimately benefit from these flows through specific distributions or stock price appreciation.*

28. *The Morningstar/Ibbotson implementation of the multi-stage DCF model does not include changes in working capital because it focuses on permanent changes in cash flows that are likely to affect shareholder value. This is the same reason*

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<sup>22</sup> Crowley/Fapp, April 14, 2008, p 15.

that extraordinary items are excluded from the income measure that is used in the model. The WCTL maintains that the exclusion of changes in working capital is a “significant deficiency” because changes in working capital for a given year can be quite large, and it cites specific examples of large additions to working capital followed by large decreases the following year.<sup>23</sup> The fact that such changes are transitory, however, means they are unlikely to affect shareholder value in the long run.<sup>24</sup> The Morningstar/Ibbotson model uses a rolling 5-year average cash flow measure and so is not significantly affected by the inclusion of a series of positive and negative values that largely cancel out over time. Exhibit 2 illustrates this point.

**Exhibit 2**  
**Effect of Working Capital on Average Cash Flow Calculation for BNSF in 2006**

	2002	2003	2004	2005	2006	Total
Original CF (\$ m)	\$765	\$421	\$513	\$1,073	\$1,317	\$4,089
Change in WC (\$ m)	\$138	-\$184	\$383	-\$248	\$204	\$293
Alternative CF (\$ m)	\$627	\$605	\$130	\$1,321	\$1,113	\$3,796
Sales (\$ m)	\$8,979	\$9,413	\$10,946	\$12,987	\$14,985	\$57,310
Ratio of Original CF to Sales [\$4,089/\$57,310] =						0.07135
Ratio of Alternative CF to Sales [\$3,796/\$57,310] =						0.06624
Original Average Cash Flow in 2006 [0.07135 x \$14,985] =						\$1,069
Alternative Average Cash Flow in 2006 [0.06624 x \$14,985] =						\$993

**Sources**

Exhibit 1, Stangle Verified Statement, April 14, 2008.  
Working capital data from Thomson Financial

<sup>23</sup> WCTL Comments, footnote 13, p. 14. The WCTL also advocates taking into account changes in debt, but this criticism is not well supported. For example, Pratt suggests incorporating only changes in long-term debt that are “necessary to support projected operations.” It has not been established that any of the major railroads need to change their long-term debt in order to meet the analyst earnings growth projections that are used in the model. See Shannon P. Pratt, *Cost of Capital, Estimation and Applications*, 2<sup>nd</sup> ed., Wiley, 2002 (“Pratt”), p. 16.

<sup>24</sup> See, e.g., Jing Liu, Doron Nissim, and Jacob Thomas, “Equity Valuation Using Multiples,” *Journal of Accounting Research*, vol. 40(1), March 2002, pp. 135-172.

29. Exhibit 2 returns to the average cash flow example used in my April 14, 2008 verified statement. Exhibit 2 shows that the inclusion of working capital changes results in only a small net decrease in the average cash flow for 2006, from \$1,069 million to \$993 million, a decrease of only 7.2%. This decrease in the initial cash flow would decrease the cost of equity only slightly for BNSF in 2006 from 14.85% to 14.67%.
30. In the terminal growth stage, the Morningstar/Ibbotson model sets capital expenditures equal to depreciation (i.e., net investment is assumed to be zero) because that assumption is consistent with a company reaching a steady state of operations and growing at a rate equal to that of the overall economy. While this assumption may indeed run counter to the actual investment plans of the major railroads, the WCTL is incorrect in suggesting that this assumption biases the cost of equity upwards. In this case, the WCTL fails to recognize that if the assumption of zero net investment were relaxed, then one would also have to relax the assumption that the growth rate in the third stage is equal to the long-run growth rate of the overall economy. If the railroads were to continue making large capital expenditures in excess of depreciation during the third stage of the model, one would expect this stage of the model to be associated with above-normal growth prospects. If the growth rate were to increase enough, the lower value of the starting cash flow in this stage could be completely counteracted, thus increasing the total cash flow in the terminal stage of the model and raising the cost of equity.
31. Moreover, the Morningstar/Ibbotson simplifying assumption of zero net investment in the terminal stage is not unreasonable. It is an assumption that Morningstar/Ibbotson makes for all of the industries that it covers. To change the assumption as the WCTL suggests would require a detailed forecast of company-specific and industry conditions eleven years into the future and beyond. I would suggest that no one's crystal ball is that accurate, and therefore assuming that all industries will grow at the rate of the overall economy is a safer assumption.

#### IV. REPLY TO COMMENTS ABOUT MODEL TRANSPARENCY AND INDEPENDENCE

32. The WCTL suggests that the Board's proposal lacks transparency and questions whether my original submission in this proceeding represented "a variant" of the Morningstar/Ibbotson model that was somehow "modified" by the AAR.<sup>25</sup> In preparing my original submission, I followed the detailed documentation of Morningstar/Ibbotson as closely as possible.<sup>26</sup> The documentation has been remarkably consistent over time, and so it apparently satisfies the many paying customers of the *Cost of Capital Yearbook*.

33. The WCTL also dismisses the value of using a model developed by a widely-respected third-party data provider because "there has been no demonstration that anyone actually considers the Ibbotson model to be a reliable measure of the cost of capital for the railroad industry specifically or different industries generally."<sup>27</sup> The WCTL's statement ignores the fact that the *Cost of Capital Yearbook* has survived in the marketplace since 1994.<sup>28</sup> Shannon Pratt's widely cited textbook on the cost of capital describes Ibbotson as producing publications that "valuation and corporate finance professionals at all levels have found useful in the estimation of the cost of capital for companies of various industries and sizes."<sup>29</sup> The Pratt textbook specifically describes the *Cost of Capital Yearbook* as "a comprehensive source of industry-level financial data" that presents "[c]ost of equity, cost of capital, capital structure ratios, growth rates, industry multiples, and other useful financial data" on over 300 industries.<sup>30</sup>

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<sup>25</sup> WCTL Comments, p 2

<sup>26</sup> The three-stage DCF model is described in the methodology section of the 2008 *Ibbotson Cost of Capital Yearbook*, Morningstar Inc., pp 5-26, and the 2008 SBBI Valuation Yearbook, pp 64-70.

<sup>27</sup> WCTL Comments, p 19.

<sup>28</sup> The volume was originally published under the title *Cost of Capital Quarterly*.

<sup>29</sup> Pratt, p. 116

<sup>30</sup> Pratt, p. 128

34. Overall, I continue to believe the Morningstar/Ibbotson three-stage DCF model represents the best option for the Board to further improve its estimation of the railroad industry's cost of equity. The Morningstar/Ibbotson methodology is an independent third-party approach that has been applied to many different industries and the estimates are regularly relied upon by financial professionals. Moreover, my review of the model estimates over time confirms that it can be a useful complement to the Board's CAPM, and I support the Board's proposal to average the estimates to determine the railroad industry's cost of equity.

## APPENDIX

The table below shows the derivation of the railroad industry WACC estimates that are plotted in Exhibit 1.

WACC Estimates Using STB CAPM and Average of CAPM and MSDCF											
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Ave.
<b>Cost of Common Equity</b>											
CAPM Only <sup>1</sup>	11.80%	11.34%	10.89%	10.48%	9.83%	9.74%	10.19%	10.43%	11.13%	12.68%	
MSDCF Only <sup>2</sup>	12.31%	13.80%	12.41%	11.64%	12.73%	13.51%	12.55%	13.48%	14.57%	14.10%	
Average of CAPM, MSDCF	12.05%	12.57%	11.65%	11.06%	11.28%	11.62%	11.37%	11.96%	12.85%	13.39%	
<b>Cost of Preferred Equity<sup>3</sup></b>											
Cost of Preferred Equity <sup>3</sup>	6.19%	6.30%	6.30%	6.30%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	
<b>Cost of Debt<sup>1</sup></b>											
Cost of Debt <sup>1</sup>	6.64%	7.20%	8.00%	6.90%	6.00%	5.00%	5.25%	5.36%	5.97%	6.15%	
<b>Weights<sup>3</sup></b>											
Common Equity	0.6264	0.6272	0.5210	0.5600	0.5670	0.5720	0.6144	0.6954	0.7695	0.7932	
Preferred Equity	0.0135	0.0182	0.0250	0.0220	0.0210	0.0000	0.0000	0.0000	0.0000	0.0000	
Debt	0.3601	0.3546	0.4540	0.4180	0.4120	0.4280	0.3851	0.3041	0.2305	0.2068	
<b>WACC</b>											
CAPM Only	9.87%	9.78%	9.46%	8.89%	8.18%	7.71%	8.29%	8.89%	9.94%	11.33%	9.23%
Average of CAPM, MSDCF	10.03%	10.55%	9.86%	9.22%	9.00%	8.79%	9.01%	9.95%	11.26%	11.80%	9.96%
<b>Analyst Benchmarks</b>											
UBS	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	
Bear Stearns	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	

**Sources**

- 1 1998-2005 Exhibit 3, Stangle Verified Statement, April 14, 2008.
- 2006-2007 Final STB decision in Ex Parte No. 558 (Sub-No. 10-11)
- 2 Exhibit 3, Stangle Verified Statement, April 14, 2008
- 3 Final STB decisions in Ex Parte No. 558 (Sub-No. 2-11)

**VERIFICATION**

I, Bruce E. Stangle, declare under penalty of perjury that the foregoing is true and correct.

Executed on October 14, 2008

Bruce E. Stangle

Bruce E. Stangle